THE OIL WEEKLY

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Oil Man's Calendar

SEPT. 22-24	American Society of Mechanical Engineers, Erie, Pennsylvania.
24-25	Michigan Petroleum Association, Traverse City.
SEPT. 27 OCT. 1	American Gas Association, Cleveland, Ohio.
OCT. 4-9	Chicago Exposition of Power & Mechanical Engineering, New International Amphitheatre, Chicago.
5	East Texas Chapter meeting, American Petroleum Institute, Kilgore.
7-8	American Institute of Mining and Metallurgical Engineers, Petroleum Division, Fall Meeting, Oklahoma City, Oklahoma.
11-15	National Safety Congress & Exposition, Kansas City, Missouri.
11-16	Oil-World Exposition, Houston, Texas.
13-14	Indiana Independent Petroleum Association, Indianapolis, Ind.
13-15	Institution of Mechanical Engineers, London, England, discussion on Lubricants and Lubrication.
14-16	American Association of Petroleum Geologists, Mid-Year Meeting, Pittsburgh, Pennsylvania.
14-16	Independent Petroleum Association of America, Houston, Texas.
18-22	American Welding Society, Atlantic City, New Jersey.
18-23	American Institute of Mining & Metal. Engineers, Atlantic City.
27-28	Indiana Independent Petroleum Association, Indianapolis, Ind.
29-30	Mid-Continent Oil and Gas Association, Texas Division, Dallas, Texas.
NOV. 8-12	American Petroleum Institute, (Annual), Chicago, Illinois.
DEC. 6-10	American Society of Mechanical Engineers, New York.
1938 MAR. 16-18	Annual Meeting, American Association of Petroleum Geologists, Roosevelt Hotel, New Orleans, La.

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LOOKING AHEAD

WITH THE EDITOR

Belt Service Lowered by Abrasive Practices . . .

Principles of Repressuring Depleted Sands . . .

ARE you getting the kind of service from your belts you should? If not, you will want to study our next "Equipment Care Series" article, which will be on the subject of belting. This article may give you some important clues as to the cause of your troubles, the remedy of which should save time and money.

An inspection of numerous belt installations, both in pumping and drilling operations, has revealed a surprisingly high number of exceedingly abusive operating practices. In view of its importance in transmitting power in the oil fields, these conditions should be corrected. The principal errors were found to be the use of the wrong type belt, unbalanced and poorly designed operating equipment, poor inspection and operating practices. These factors have greatly limited the service life of many belting installations. How to look for these abuses and correct them is the aim of the article.

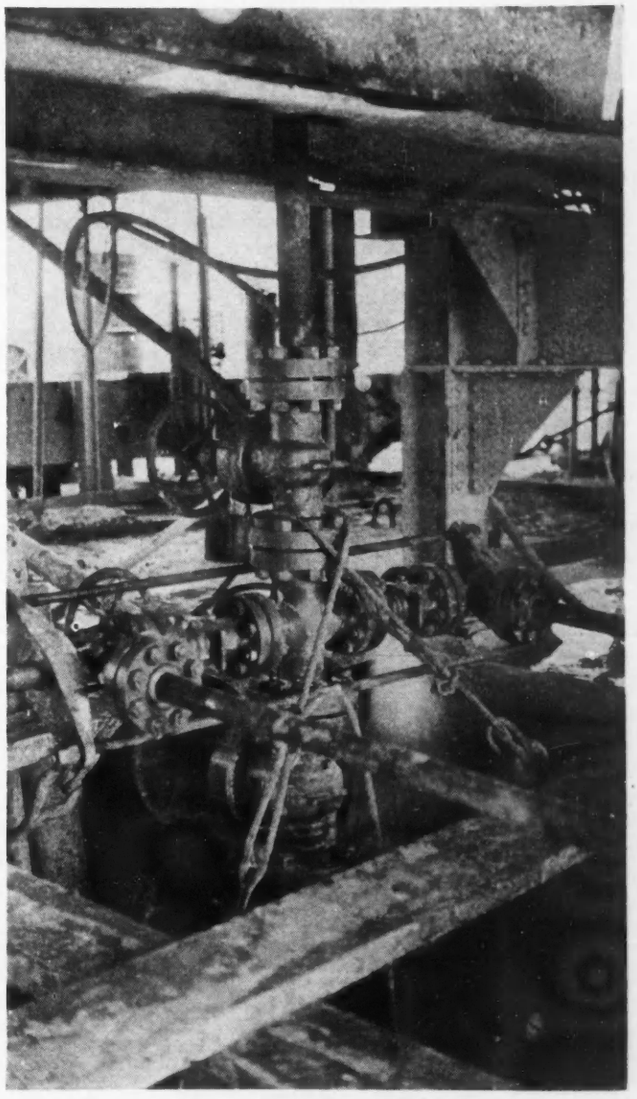
A number of concerns have found that the service life of the average belt installation can be increased by proper selection and by exercising common sense in operating practices. In some instances care and maintenance have doubled and even tripled the life of belting in several producing districts. Perhaps you can join the group of operators that are getting better belt service.

The article will appear next week.

ALSO to appear will be the second part of the two-article series on repressuring, which commences in this number. These are a consolidation of the principles of repressuring as developed by engineers and operations.

The changing panorama

this week



MOST IMPORTANT DISCOVERY in the Louisiana Gulf Coast in years has been the finding of the first production in the Sparta formation, which underlies previous producing zones. It also opened a new field along the Conroe trend, which has been inactive for sometime. The strike means the redrilling of many of the fields on the Conroe trend in both Louisiana and Texas Gulf Coast, and that wildcats will not necessarily condemn an area in the future until the Sparta is tested. The discovery well, Continental Oil Company's Tate 1, is shown here making its first flow. Depth of the well is 9015-35 feet.

OVERSHADOWING all other events is the coming Texas statewide proration hearing in Austin September 20. While this meeting is of considerable importance each month, since the state produces 45 percent of the nation's crude oil and therefore its action usually governs the course of the country, the present hearing has assumed far greater significance.

East Texas Again Acute Problem

Texas proration officials are confronted with their perpetual problem—the allowable for East Texas field—and find themselves behind the "eight ball" before the game starts. A constantly accelerated decline in the field's pressure threatens to put all wells on the pump, unless the allowable is reduced drastically. In the past commission members, who since 1933 have been wedded to an energy conservation program, have not hesitated to curtail production. But now the situation is very different. They are confronted with a stiff obstacle in the form of the state's marginal well law—which prohibits curtailments of wells below certain limits. The commission, hoping operators would demand smaller allowables, has been dodging the issue for several months, by not changing the pro rata percentage in the field. No longer can it do this.

Two Courses Open

Two courses are open. One would be to leave the per well allowable at its present level, which would be astray of its program of conserving energy. The other would be to curtail production. The latter would place a new interpretation on the marginal well law, as it is viewed by the majority and as the commission apparently has interpreted it in the past. General opinion has been that the law provided for a minimum of 20 barrels per well in fields of the depth of East Texas, and the smallest allowable in the latter field for sometime has been on this basis. Meanwhile, new completions have resulted in top allowables being reduced until they are but a fraction over 20 barrels per well.

Important Repercussions to Occur

Whatever course is decided upon, there are bound to be important political and possible legal repercussions, for some operators have indicated they would sue if asked to reduce further the output of their wells. This would be done on the basis of equity and allegations that the marginal well law was being vio-

lated. Too, the decision will establish an important precedent for future rulings of the commission.

Moreover, the action decided upon this time will not settle the question of East Texas proration permanently. It will arise again next month, or shortly after. The continued completion of wells, about 60 per week, will constantly keep the commission in a sweat. The field, it appears, has arrived at that stage in life when output must be even more sharply curtailed or pressures will decline. At the same time it has reached a point where wells cannot be cut back any more, at least to a material extent.

Crude Output To Be Reduced

Meanwhile, there are indications of an early restriction of crude production in the United States. Stocks are being increased, and a seasonal slump in gasoline consumption is to be expected.

More important than that the total volume of stocks is on the up-grade is that the number of days of supply has been increasing recently. This is different from the situation preceding, for in the former an increase in the quantity in storage was offset by gains in consumption. Therefore, it is of little importance to know that the stocks on a certain day totaled so much. Of greater significance is the number of days of supply.

Labor Results Differ

Labor occupied a prominent position last week. Actions took place on widely scattered fronts, and the results were just as different as the sites. In the United States the most important development occurred in a hearing at Houston before the National Labor Relations Board. American Refining Company was charged by C.I.O. with failing to negotiate with a purported majority of its refinery workers. The highlight of the hearing, which became heated at times, was the refusal of the examiner to order the union to furnish company attorneys with the names of C.I.O. members working at the plant. A telegraphed appeal to the NLRB headquarters at Washington was filed by American Refining Company's attorneys and accompanied by a protest from union legal advisers. The case was being watched with interest, as it probably will have a bearing on future hearings.

In Mexico developments were different. The 57-day old strike in the highly productive Poza Rica field, which also included two of the nation's largest refineries, was settled and 1200 workers were back on the job. Settlement resulted from long conferences between the workers, the company and the government.

While these actions were taking place in the southern part of North America, Alberta Province, Canada, was preparing to establish basic minimum wages for all male workers. Companies will be given an opportunity to reach an agreement with employees, but unless they do so by a certain time the government is prepared to handle the situation.

Market briefs

Outlook—Better crude control is steadying influence.

Crude Market—No further reductions of prices made.

Refined Oil Markets—Prices holding at previous levels.

CURRENT OPERATIONS

Week Ended	Daily Crude Production	Daily Crude Runs to Stills
September 11..	3,642,400	*3,445,000
Previous week.	3 692,550	*3,445,000
Year ago.....	3,020,850	3,095,000

CRUDE STOCKS

Date	Crude Oil (Barrels)
September 4.....	310,417,000
Week ago.....	309,506,000
Year ago.....	298,448,000

REFINED OIL STOCKS

Date	Gasoline (Barrels)	Gas & Fuel Oil (Barrels)
September 11..	66,456,000	114,666,000
Week ago.....	67,048,000	113,443,000
Year ago.....	57,918,000	113,109,000

DRILLING

Period	Wells Completed
Past week	545
Previous week.....	626
Year ago.....	426
ar Total:	
This year.....	20,755
Last year.....	17,291

* All time peak.

Wasson Expanded

West Texas continues to reward exploratory drilling, as well as development in proven fields, with the result that some buyers of crude are prorating purchases and the area is facing inadequacy of pipe line outlets and steel storage.

Wasson field, which has headlined news from the area for several weeks, looming as a market factor reserve, again was extended 1½ miles during the week. A four mile west extension also looms for Duggan pool in Cochran County, where a wildcat, 51 feet higher structurally than the discovery well, is showing for a producer. Eight miles beyond this, The Texas Company has a rainbow of oil on the Slaughter property.

New Kansas Fields

As the week closed it looked as though Kansas would contribute two new fields next week, one in Stafford County and the other in Sedgwick County. West Kansas is calling the wildcatters interested in deeper production.

In Oklahoma an independent discovered a Wilcox sand pool in Seminole County, an event which caused spudding of three tests immediately. Fitts field is not dead yet, as an outpost completion on the northwest flank established a potential of 2189 barrels this week from Hunton lime.

New Coast Formation

South Louisiana offered a development which may cause a revival of drilling on leases surrendered along the Conroe trend. Continental Oil Company developed production from the Sparta formation, one which has not been explored along the trend. Gulf Oil Corporation probably will open a new field next week on Timbalier Bay.

Closely associated with the Sparta strike in South Louisiana, Newton County production developed from Cockfield formation will contribute to revival of exploratory efforts along the Texas Coast end of the Conroe trend. Texas Gulf Coast also established commercial oil production on the Garwood prospect in Colorado County during the week.

Vacuum pool in Lea County, New Mexico was extended a half mile southwest during the week.

Repressuring Study

In spite of a marked trend toward more efficient producing methods, thereby resulting in a greater recovery percentage, a large quantity of oil remains in the reservoir when operations cease. Thus, the problem of further improving production methods remains with engineers, and they continue to study the replenishing of gas pressure in old fields. Until now the data developed by such work has not been incorporated in any consolidated or brief form. On page 17 appears the first of a series of two articles written for this purpose.

A Pipe Line Problem

Sometimes the desire to increase the carrying capacity of established pipe lines results in a problem of attempting to place larger engines on foundations built for smaller ones. One concern in adding to the base foundation used a specially constructed drill that did away with the hazard of clipping the old grout. How this was done is told on page 20.

Seismograph Correlation

The hows and whys of the correlation method of seismographing for oil are told in a lengthy, well-illustrated article that commences on page 24.

Proration Matters

Question of East Texas proration again acute . . . Well allowables in the field must be cut back to check rapidly dropping bottom-hole pressure, but ruling to do this might run afoul of the state's marginal well law minimum quota.

THE coming Texas statewide hearing far overshadows all other proration matters. This regular monthly hearing always is the most important national meeting of its kind, for Texas produces about 45 percent of the United States crude, and upon its allowable depends whether production will exceed consumption demands or not. However, this month the meeting assumes far greater significance. The question to be discussed that has so greatly increased the importance of the meeting is "What will be done in the East Texas field?" Rapid drop of bottom-hole pressures in the field the past two months has created a demand that the per well output be reduced so as to conserve energy, but the commission is faced with a ticklish problem since the per well allowable already is at the marginal well minimum as the law is interpreted by many. The action of the commission therefore becomes of first ranking national interest.

Texas hearing outstanding

Interest in the Texas statewide proration hearing at Austin September 20 is expected to center around the important question of the East Texas field.

Last month the commission reported a 13-pound drop in pressure for the field, and tests by oil companies this month indicate a further decline of 10 pounds. At last month's hearing V. E. Cottingham, director of production for the commission, testified that in his opinion this decline was excessive and recommended that the commission order a further reduction of the allowable for the field.

Water Has Increased

Not only is the decline in pressure aggravated, but the increasing volume of salt water withdrawn from the reservoir along with the oil results in the increase of the total displacement from the reservoir, and therefore tends to further accelerate pressure decline.

Thus it appears that from the standpoint of maintaining pressure, a program to which the Railroad Commission has been wed since 1933, there is nothing left to do but cut the allowable. Whether this can be done and how it may be accomplished is a problem which the Railroad Commission must face between now and the first of the year. Operators in the field have already begun to buy pumps even though their wells continue to flow, and the number of these pumps put into use has increased every day.

The commission is also faced with the problem of the marginal well law as well as legal and political difficulties which are certain to arise from any order reducing the allowables now in effect.

Thompson Says Field Sick

After the last statewide order was issued, Commissioner Ernest O. Thompson intimated that the commission hoped the industry would request a cut before the pressure had dropped too far. Asked why the commission did not follow Cottingham's recommendation, Commissioner Thompson declined to answer the question directly.

"I might give you some light," he commented. "We held the hearing and took evidence that showed that the pressure decline is excessive and that rate of decline is accelerated. In other words, we pointed out that the patient is sick."

"If a man gets sick and calls in his doctor, he may not want the doctor to operate. If the same man concludes he is going to die, he is willing to subject himself to the most strenuous treatment."

Commissioner Thompson did not deny that the logical interpretation of this parable was that the commission hoped that a majority of East Texas Operators, fearing that their properties would be damaged, would come in to a hearing and demand that the commission reduce the field allowable.

Commission Chairman C. V. Terrell refused to comment, however. He pointed out that he did not ask Cottingham for any recommendation on East Texas and stated that he "purposely" avoided asking for any such recommendation. It was Commissioner Lon Smith who asked for and obtained from Cottingham the recommendation that the field allowable be cut.

Commission engineers revealed that they were prepared to present at the hearing data showing what the East Texas allowable would be if the minimum allowable were cut from 20 to 18 barrels per well. Since commission engineers are not prone to make such calculations without instructions from their superiors, it appeared obvious that the commissioners had looked into this question.

To Interpret Marginal Law

Such a reduction would undoubtedly involve a new interpretation of the Marginal Well law. Prior to this time allowables fixed by the commission have indicated that the commission believes that the minimum allowances fixed in the marginal well law are the minimum allowances which the commission may fix for wells in any field. It appears, however, that they have altered this opinion.

The same engineers who made the calculations pointed out that the Marginal Well Law does not prohibit cutting the allowable for any flowing or pumping well below the minimum figures provided in the statutes, unless such a reduction would affect a well so that it would "be damaged, or result in a loss of the production ordinarily recoverable, or cause the premature abandonment of same," if the daily production is cut below the figures specified.

Under this interpretation it appears likely that the Railroad Commission could reduce allowables for wells in East Texas to some eight barrels a day. At a hearing in Austin more than a year ago petroleum engineers testified, and presented figures to support their contention, that a well in East Texas could be operated profitably on eight barrels a day whether it was pumped or flowed.

With the 18 barrels minimum, wells would be allowed to produce 2.09 percent of the hourly potential. The top allowable for the best well in the field would be 23 barrels; however, a majority of the wells would get the flat 18 barrel allowance.

Because of the higher price for the production which operators are now obtaining, the profit from producing eight barrels would be greater than it was a year ago when the record referred to was made.

While some have indicated they will go to court if wells are cut below 20 barrels, one prominent attorney has declared that there is no doubt that the commission can make the reduction as outlined above.

As he interprets the Marginal Well Law, "It applies only to wells which, under a 30 day test, are unable to make as much as 20 barrels a day. Cottingham testified that there were less than 200. . . . There is nothing whatever in the law which prohibits the commission from cutting known marginal wells to whatever figure necessary to prevent in a reasonable way waste of oil and gas. Under all the facts as they now exist, I feel reasonably certain that the commission can cut flowing and larger pumping wells at least to an 18-barrel minimum and probably to 16 though there is still the problem of making a distinction between the good properties and the bad properties," he said.

Politics Enter Picture

Since Commission hCairman C. V. Terrell must run for re-election next year, there is no doubt that he will consider the matter thoroughly before approving an order which would undoubtedly be opposed by a large number of operators. On the other hand, an astute opponent might well raise the issue that the commission has abandoned its

conservation program as a matter of political expediency. Such an argument might have vast influence on oil people called upon to vote for a commissioner who is to regulate their business for the next six years.

Water Withdrawal Rate

It is known that one producer plans to present to the commission members at the hearing his views on the water withdrawal rate in the East Texas field. It is believed he will contend the dissipation of the water drive energy is similar to the dissipation of the gas energy, and that the volume of water production therefore should be regulated by the commission.

Otis gas prorated

September allowable for the Otis gas pool of Rush and Barton counties was set at 354,998,000 cubic feet last week by the conservation division of the Kansas Corporation Commission. First monthly allowable gas schedule to be issued by the commission, the production is divided among 30 wells in the field; the schedule lists 55 producing wells in the field having an aggregate potential of 1,520,154,000. It is Kansas' first gas field to come under proration regulations.

Oklahoma gas tests

A schedule of tests for gas wells in the Oklahoma City field has been released by the corporation commission, showing a total of 139 wells to be tested between September 20 and October 21. Operators are requested to shut in the well for a period of 24 hours prior to the test. Wells taking tests by back pressure method must be shut in immediately before or after the test.

Postpone Burrton hearing

Gas waste hearing on the Burrton field of Reno and Harvey counties, Kansas, has been postponed from September 23 to October 27. Additional field tests made the delay necessary.

Labor Situation

Company is refused list of its workers belonging to the CIO . . . Mexican strikers return to work . . . Minimum wage scale for Alberta, Canada.

As labor activity interest in the United States centered around a heated and important labor board clash between one of the unions and a refinery concern, word came from Mexico that the 57-day old strike in the Poza Rica field had been terminated by agreement. Meanwhile, it was announced that a minimum wage scale would be established for all male workers in Alberta, Canada.

Wants to know members

Most important development at a labor difficulty hearing in Houston, Texas, last week was the demand by company attorneys that they be furnished with a list of CIO members working at American Petroleum Company's Norsworthy refinery, the subsequent protest by the union, which was followed by the examiner refusing to issue such an order. The clash grew heated, and ended in a telegraphed appeal to the National Labor Relations Board at Washington. The appeal also bore an objection by union attorneys.

This question was considered important in petroleum circles, for it may have a bearing on future labor board hearings.

It was explained by the examiner that it was a matter of public policy not to reveal the names of union members as a matter of protection for them.

CIO charges that the company failed to negotiate with a purported majority of its 140 refinery workers. The union claimed 107 members at the plant. Additional allegations of CIO were that the company officials had circulated matter derogatory to the union, and had allowed a company federation to be formed during working hours.

Mexican strike settled

The Mexican oil labor situation is considerably improved as a result of settlement of the 57-day old strike, which had put out of commission Compania Mexicana de Petroleo El Aguila, S. A.'s highly productive Poza Rica field in the State of Veracruz, as well as the firm's two largest refineries, one in Mexico City and the other in Tampico.

Twelve hundred workers have returned to their jobs, assuring full functioning of the production and refining units, as well as ample supplies of gasoline and other products for the federal district and other Mexican markets.

Settlement of the strike resulted from long conferences between the workers, the company and the federal government's representatives. Compania Mexicana de Petroleo El Aguila, S. A. agreed to pay the workers 75 percent of their wages during the time they were on strike and about $7000 strikes costs.

Early in August Mexico's federal board of conciliation and arbitration declared the strike lawful, at which time students of the industry in Mexico forecast a long struggle for the company. The ruling meant that the federal labor authorities could not intervene in the conflict.

Considerable of the item charged up to strike costs were spent by the workers for newspaper advertisements to make charges against the oil company.

Minimum Canadian wage

Notice that a basic minimum wage for all male workers in Alberta, Canada, would be established next week has been given by Ernest C. Manning minister of trade and industry.

Designed to improve working conditions throughout the province, Manning said the basic minimum wage would come under the Alberta Male Minimum Wage Act of 1936. It would "assure just and equitable wages," he added.

Hitherto there has not been a minimum wage for men in the province, although one has been established for women for many years. Manning declared that his department would insist that employers and employes set a standard of wages and hours under the Industrial Standards Act and if the organizations and employees failed to reach an agreement within a certain time, the department would establish its own scale under the combined provisions of the hours of work act and minimum wage acts. Under these measures, the department has power to set both wages and hours for any zone, industry or firm.

"Schedules already are before the Board of Industrial Relations and the cabinet and the whole matter is receiving most careful consideration," Manning asserted. "In preparing these schedules we have gathered information from all parts of Canada and the United States."

Miscellany

Call compact meeting and special Texas tax session

Texas Legislature

Governor James V. Allred has called a special session of the Texas Legislature to be convened on September 27.

The call included taxes and revenue measures only.

The Governor has indicated clearly that he thinks taxes should be materially raised to absorb the $15,000,000 deficit with which the state is confronted. He has expressed the opinion that this increase should come from franchise and other corporate taxes, as well as an increase in the gross production tax on crude oil and sulphur.

In press conferences the Governor has bitterly denounced oil pipe lines operating in Texas, charging that they do not pay a fair share of the taxes, a share which he thinks should be larger because of the profits which the companies have reported to the State.

Interstate Compact

The Interstate Oil Compact Commission has accepted the invitation of the Houston Oil Show to hold its next quarterly meeting at Houston, on October 14 and 15. The acceptance was announced last week by Compact Commission Chairman Ernest O. Thompson.

There are now six oil producing states which are members of the Compact, and only California and Louisiana, among the large producers, have remained outside the group.

It is probable that an invitation will be extended to Louisiana's Governor Leche to attend the Houston meeting and that California will be invited to send a representative.

Stock Situation Has Changed

Number days supply, not total volume, most important... Should calculate these on future demand basis as that is when it is used ... Proration affords means of leveling seasonal ups and downs

By ALEXANDER B. MORRIS
Petroleum Engineer
Tulsa, Oklahoma

THE signal is definitely set for an early restriction of crude production in the United States. Much to this effect has been appearing in the press during the past six months, but aside from pointing out that the Bureau of Mines estimates of crude requirements were regularly being exceeded, no great emphasis has been placed on the actual effect of these accretions of excess production upon the above-ground stocks of the country. In fact, so great has been the demand that this effect, in terms of the quantity of oil that will actually be needed during the weeks next following each inventory date, has been negligible. This has largely been due to the seasonal increase in demand during the early part of the year absorbing the excesses when they have been converted into the number of days required to exhaust them at the rate of demand prevailing, and has given validity to the statements of some that over-production was a threat rather than an actuality, even though stocks were increasing.

Days Supply Important

The situation has changed during the last three months, however, so that in addition to the fact that production is still in excess of the Bureau's estimates of needs, and the further fact that actual quantities are on the increase, the actual inventories above-ground are increasing in relation to the demand which will probably exist during the next ensuing weeks or months, during which equivalent volumes of crude oil will be used.

It is of little consequence to know that the stocks at the end of March totaled 297,496,000 barrels, and at the end of April totaled 304,161,000 barrels, if that is all that is given. One might readily suppose that the increase would be absorbed by the summer increase in demand. If the number of days that each of these stocks will last is reckoned in the conventional manner, by comparing it with the demand prevailing during the month at the end of which the inventory was taken, one will actually be confirmed in that conclusion. For the March stocks at the March rate of demand represent a 94-day supply, whereas the April stocks at the April rate of demand represent a supply of only 91 days, an apparent reduction of stocks in relation to demand. If, however, we exhaust these stocks by the demand which actually prevailed during the period immediately *following* each inventory date, it appears that these stocks represented, respectively, 87 and 89 days' supply, or an increase in stocks with respect to demand instead of an apparent reduction.

Table 1 sets forth the number of days which the stocks at the end of each month actually lasted, and the number of days' supply represented by these stocks as computed in the conventional manner first above described. Here is clearly shown the irregularity of the record as furnished by the conventional method, as well as the wide variance of the results from the actual at critical points. In all years except 1936 and 1937, during which the recovery in demand from depression lows has overcome the seasonal fluctuations and served to bring the two sets of values closer together, the conventional values are normally substantially higher than the actual during the early months of the year, and regularly and substantially lower than the actual during the summer and early fall months. This gives an entirely distorted picture of the actual movements of stocks in relation to demand.

This result devolves from the fact that in the conventional method of computation, each computation is entirely independent of every other one, either ahead of it or following it. Actually, however, the stocks on hand at the end of March are consumed during April, May and a part of June. Those on hand at the end of April are consumed during May, June and part of July. Thus each computation is related to the one on either side of it in the table by two out of three basic values, which are identical in each succeeding pair. Table 2 sets forth the method of computing the actual number of days' supply represented by month-end stocks, and illustrates this inter-relation of consecutive results obtained.

Reduction Needed Now

Reverting again to the opening statement that some steps should very soon be taken to restrict the

TABLE I

Comparison of Crude Stocks in Day's Supply as computed in conventional manner, with the actual number of days required to exhaust these stocks.

	1931		1932		1933		1934		1935		1936		1937	
	Conv.	Act.	Conv.	Act.	Conv.	Act.	Conv.	Act	Conv.	Act.	Conv.	Act	Conv.	Act.
January	175	162	162	154	154	142	149	140	135	127	109	106	92	89
February	170	157	161	152	150	136	143	137	128	124	106	104	92	88
March	168	153	163	153	152	134	148	134	132	121	110	103	94	87
April	157	151	150	157	142	129	137	133	130	118	107	102	91	89
May	153	152	147	159	141	132	138	134	124	119	103	100	92	89
June	152	153	145	161	135	135	128	135	115	115	99	98	92	90
July	149	156	151	161	131	140	131	136	112	113	98	96	90	90
August	141	156	157	160	136	146	131	137	113	112	95	96	..	..
September	144	156	161	159	138	150	135	136	109	111	93	94	..	..
October	145	157	158	158	139	149	131	135	110	110	93	91	..	..
November	150	158	157	154	148	146	131	133	109	110	93	92	..	..
December	156	157	154	147	151	144	132	130	110	109	92	91	..	..

production of crude, this can now be appreciated as being necessary by consulting the last column of Table 1. During the past four months, that is from March to July, 1937, stocks in relation to demand have increased from an all-time low of 87 days' supply to 91 days' supply, and this in the face of the heaviest demand that has ever existed. It will be observed by referring to Table 2 that this last figure of 91 days depends wholly upon estimates of demand, and for that reason may not be valid. The estimates which were used are fully set forth in the table, however, and anyone may substitute therefor any other estimates he prefers. I believe, however, that no changes can be made in these estimates of sufficient magnitude to affect the result by more than one day, and that any change made will be more likely to increase than to lower the 91 days set forth in the table.

With the thorough control over production afforded by the proration regulations now generally in effect in most localities, there is no excuse for permitting inventories from getting out of hand. The key to the situation seems to be in the demand for motor fuel, which is highly seasonal, but which fluctuates with remarkable regularity. For some reason the stocks of motor fuel have been maintained within quite narrow limits throughout each year, so that in terms of days' supply they vary almost exactly inversely to the demand for motor fuel, the peaks in stocks coinciding very closely, in point of time, with the troughs in demand. Also, in respect of days' supply, there has been but little change in the motor fuel situation since 1932, the earliest year for which directly comparable figures are published. During 1932 and 1933, stocks of motor fuel fluctuated between 44 and 57 days' supply. This year, 1937, the high point, in February, was 54 days, and at the end of July this had fallen to 40 days. It will probably reach a low of 38 days in August or September before it starts to swing upward once more. Now while six weeks supply of motor fuel is certainly not an alarming amount, it can be manufactured and distributed so rapidly that there seems to be no good reason why they should be pegged at approximately the same amount the year around. A slight restriction of runs to stills beginning in August would prevent the February peak from reaching its usual point of around 55 days; and a slight increase in runs to stills beginning in March would prevent the August low from falling to its customary 40 days.

The existence of stocks representing a great number of days' supply at a time of the year when current demand is at its lowest appears to have constituted a threat to the price structure, which could be eliminated if refiners would permit their stocks to decrease during the fall months in proportion to the easily ascertainable decrease in demand.

It is frequently stated that the amount of above-ground stocks of crude have no effect upon the price, and are of relatively small importance, since all that is necessary to increase these stocks tremendously is to turn a few valves and permit the wells to produce faster. If price were solely dependent upon elements of intelligence alone, this would be a valid argument. Most elements of value, however, are purely psychological, being more or less emotional attitudes toward what one supposes someone else's attitude toward the same matter will be tomorrow. At least this belief is of the same nature as other elements of value, so that one cannot dogmatically state that its effect upon price is nil.

One definite quantitative result of decreased inventories would be the freeing of operating cash which is now tied up in unnecessarily large stocks. Though all inventories are accorded the status of current assets by accounting convention, so that an increase in inventories does not disturb the relation between current assets and current liabilities — the gauge by which working capital is generally measured—it has long been the feeling in many quarters that the oil industry has disguised an unwholesome current position by virtue of the preponderance of inventories in the current assets. Here operating cash becomes sequestered, and though designated as liquid by courtesy, it cannot be seriously questioned that many of the larger operating companies would have difficulty in liquidating their enormous stocks at balance sheet prices. Whereas this may be of slight importance from an operating standpoint, since the operators never contemplate the possibility of complete liquidation, bankers view these matters differently. The more prominent question of price is therefore not the only consideration where inventories are concerned.

The time to close the stable door is before the horse has gone. His head is looking out now, but a little restraint on the part of the marketing departments should suffice to enable the door to be closed with him safely inside.

TABLE 2

Method of Computation of Actual Days' Supply, 1937, showing interdependence of consecutive computations and the Estimates of Demand used for late months.

	January		February		March		April		May		June		July			
	Bbls.	Days	Bbls.	Days	Bbls.	Days	Bbls.	Days	Bbls.	Days	Bbls.	Days	Bbls.	Days		
Stocks at close of	286759		289972		297496		304161		308209		308744		307800			
Runs to stills plus Exports in																
February	88761	28														
March	97596	31	97596	31												
April	100327	30	100327	30	100327	30										
May					103692	31	103692	31								
June							105504	30	105504	30						
July									106000	31	106000	31				
August											107350	31	107350	31		
September													105280	30	105280	30
October															102000	31
Sub-total	286684		197923		204019		209196		111504		213350		212630			
Remainder	75		92049	27	93377	26	94961	28	96705	28	95394	28	95170	29		
Total Days' Supply		89		88		87		89		89		90		90		

Note—U.S.B.M. estimates of demand for July, August and September. Author's estimate of demand for October.

SURVEYING THE ECONOMIC FIELD OF

Repressuring Oil Sands

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PART ONE

IN RECENT years there has been a marked trend toward more efficient methods of production, thereby resulting in a greater percentage recovery of oil. Improved drilling methods and machinery, knowledge of subsurface geologic conditions, proper well spacing, and a growing understanding of the scientific principles which allow a better utilization of subsurface energy have all contributed toward greater recovery. Still, in spite of all these advancements, we find that a large amount of the oil remains in the sand after all normal flow and pumping have ceased—an amount which in most cases is even greater than that which has been removed. An estimate was made in 1925 by a committee of The American Petroleum Institute[1] that after all pumping and flowing have ceased, there will still remain in the ground more than twenty-six billion barrels of additional oil. It is reasonable to believe that improved production methods may tend to lower this figure, but, offsetting this, we have the discovery of hundreds of new fields since that date, so we may conclude that the figure is conservative. Thus, the problem of producing oil more efficiently and of obtaining greater ultimate yields becomes self-evident. It is useless to suppose that in any process all the underground oil could be recovered, but if only five or ten percent of the oil that would normally remain in the sand could be produced, then the recovery process would have more than proved its value.

The cost of developing an area is more or less fixed within certain limits, whatever the amount of recovery may be, whether 30 percent or 50 percent. Therefore, the less the cost per barrel of oil the greater will be the return to the operator. The only way to effectively reduce the unit cost of a barrel of oil is to produce more barrels before the economic limit has been reached or to produce over a longer period of time. Normally the desire of the operator is to prolong the natural flowing life of the well; after this method has been exhausted he attempts to obtain the maximum recovery by artificial means within economic limits. The results of repressuring have been to lengthen materially both the natural and the artificial life of the well. More modern production practices have recognized the fact that, for the most part, the natural gas which is associated with the oil either in solution or as a free agent is the major force in driving the oil from the ground. A great amount of research has been conducted on replenishing the gas pressure in fields now producing and in restoring the pressure to fields which are regarded as past their economic limit.

Terminology

The terms "pressure maintainance" and "pressure restoration" are both broadly used to cover the two principal fields of repressuring. The former is used when the injection of the pressure medium is begun simultaneous with the opening of the field. Its purpose is to maintain the pressure at or near the original value and it is carried on along with the producing operations. The latter term, pressure restoration, is used when the injection of the medium is begun after the pressure of the field has declined considerably below its original value. As is often the case, the pressure may be only a small fraction of its original value so that pressure restoration is much more difficult and usually less fertile of results than pressure maintainance. Sometimes what was begun as restoration will in its final stage change to maintainance. In other words, after the pressure has been sufficiently restored, the problem will be one of maintaining the pressure during the production of the oil.

Before proceeding further, the writer wishes to make known the fact that this paper has been prepared without any experimental research on his part. It is an attempt to survey in a general way the field of repressuring oil sands and to incorporate the general principles of the subject. All statements made and all material presented have been collected from the various authorities listed in the bibliography.

Problems of Repressuring

It would be useless to suggest that any panacea or any Utopian method for repressuring can be arrived at to apply at once to any and all projects. However, there are certain fundamental principles and certain general statements which will apply to all cases.

The application of pressure maintainance does not offer quite so many problems as pressure restoration. Most operators are of the opinion that maintainance should be started

as soon as possible after production has started. This, of course, may be hindered by certain field conditions such as an abnormally high rock pressure, which would require high-powered compressors to inject the gas back into the sand. In such cases it is often the policy to wait until more practicable pressures are reached. The result of pressure maintainance will in almost all cases extend the natural flowing life of the well, retard the rate of oil production decline, lengthen the period of gas lift operations, and increase the pumping production above that obtained by delaying or not repressuring at all. At the same time the encroachment of edgewater can be successfully retarded by injecting the gas during the flush period. This has been found to be the most successful method of stopping edgewater encroachment.

Flush Gas Waste

During the flush stages of production the natural gas associated with the oil is most plentiful, and is therefore wasted to a greater degree. Returning the gas to the sand not only serves the purpose of reestablishing original conditions but also provides a method of storing the gas for future use. By returning the gas, the normal gas-oil ratio is kept at a minimum. If, for example, a well produces 1,000,000 cubic feet of gas and 1000 barrels of oil a day, the gas-oil ratio would be 1000 cubic feet per barrel. However, by returning the 800,000 cubic feet of the gas to the oil-sand the gas-oil ratio would in effect be reduced to 200 cubic feet per barrel. At the same time the available supply of gas is increased by the amount injected as an assurance that at a later time the gas may be removed as needed.

Value of Early Input

Aside from the above considerations, it must be remembered that in the early life of the pool the sand will have a higher saturation of oil and gas than at any other time. The oil and gas will not have separated as will be the case in the later life of the pool, and the producing horizon has a greater ability to transmit the input gas energy more uniformly from input to producing wells. Since the oil will still occupy most of the pore space it will offer a more uniform resistance to the passage of injected gas and in effect will be pushed by the gas toward the producing wells. The gas will, therefore, be more likely to go to all portions of the sand than when a large portion of the oil has been removed. The danger of by-passing will be materially reduced since not enough of the sand has been drained to form channels. In the later life of the pool the gas will tend to take the path of least resistance through the more permeable layers, and the tighter sands directly adjacent to partially depleted sands will offer such high resistance that the gas will not penetrate. In some cases it has also been found that certain tight areas of low permeability would not yield their oil after the pressure has reached a certain critical point, so it is evident that the reservoir pressure must be maintained sufficiently high to allow these areas to drain thoroughly.[5]

25 Percent Enough Sometimes

It has been found in many cases that by putting about 25 percent of the original gas back into the sand the original reservoir pressure could be maintained. This may be explained by the theory that the original gas was adsorbed on the surface of the oil or on the surface of the sand and that when put back into the sand it would not enter that state.[2] Another explanation may be found in the fact that there is very little agitation of the oil-gas interface and the rate of diffusion and solution of the gas into the oil is very slow. Hence, by returning just a portion of the original gas the pressure may be maintained in some cases.

Pressure Determination an Individual Problem

So far as is known at present, there is no definite pressure at which the gas should be injected into the key well. The determination of the most efficient operating pressure must be made on each individual field and it bears no relationship to the rock pressure. In high-pressure work the principal objections are the installation and operating costs of high-pressure equipment and the explosion hazards involved. Not only must the compressors be larger to raise the gas to the pressures required but heavier casing or tubing must be used and the gas sand must be packed-off or cemented tightly so that there can be no leaks. The cost of compression will, of course, be a big item if the gas is compressed from atmospheric pressure. However, the gas is often trapped in high-pressure separators so that the input side of the compressor may be 250 or 300 pounds per square inch. It is in this range that the cost will be greatest. The pressures required in injecting the medium into the sand will be dependent on many factors such as permeability and porosity of the formation, the size of the sand grains, the degree of saturation, volume of gas injected, degree of water encroachment, and the distance between input and producer well.[1] In some cases the input pressures have been as high as 500 pounds per square inch above the formation pressure while in others it has been only 5 pounds per square inch above formation pressure.

Proper Location Important

In repressuring the new field the proper location of input wells must be determined. In the case of the new as well as the old field, this will be determined by several factors: oil, gas and water conditions, structural conditions, and property lines. It can not be said that any one method is the best to determine the proper location of key wells for pressure maintenance. In some cases it is thought best to locate input wells low on the structure providing property lines do not interfere since it is thought that the gas has a greater spreading effect when injected from that point; however, there is no definite proof to that effect. If the input wells are located close to and upstructure from the water front, the water encroachment is more effectively retarded. As for property lines, it is obvious that key wells should not be located close to them unless both operators are cooperating on the project. Otherwise much of the gas would be lost to the lower pressure sands on the adjacent property. If the key well can be located in regard to sand porosity and permeability, it is often thought advisable to inject the gas through a so-called tight sand in an effort to drive the oil toward the more porous formation where it may be more easily moved. This procedure will usually call for a higher injection pressure.

Restoration More Difficult

The problems involved in pressure restoration are much more difficult than in pressure maintenance since there are so many factors which work against the successful operation of the project. In all cases, before any work has been done or any actual repressuring started, a very careful study should be made of the area involved. This study should be complete as to the structural condi-

tions underlying the area. The depth, thickness, and character of the oil sand should be determined. Sand at a shallow depth will require less injection pressure than deeper sands. Naturally the thickness of the sand will be important in determining the amount of gas that will have to be injected. The character of the sand in relation to grain size, arrangement of the particles, and amount of cementing material will be important for determining the porosity. If a large amount of cementing material is in the sand then the permeability will probably be low and a high injection pressure will be necessary. A shale break should be studied, for it may separate layers of sand of different permeability and repressuring will tend to drive oil from layers having greatest permeability without affecting the rest of the sand.

Find the Water

The most important subsurface condition to investigate is the location of water and the height of the water-table, as the encroachment of water is one of the serious hazards to successful repressuring. Without accurate determination of the location of edgewater and of the amount of water that may already have flooded the sand, the use of repressuring may result in an increase of water production only. Likewise the encroachment of water may cause trapping of the oil in some portions or by-passing by all the gas injected. If air is used as the pressure medium, the presence of water may add serious emulsion hazards. Even with gas there is some danger of emulsion formation. Air in the presence of water will increase the likelihood of corrosion to casing, valves, pumps, and all equipment through which the water may pass.

Avoid More Porous Sand

It has often been found that the top portion of the producing sand is likely to be gas bearing and as a rule more porous than the other portions. In a case of this sort it would be best for injection wells to be located down-structure near the edgewater line, so that as little gas as possible will reach the porous layer. If the gas sand is separated from the oil sand by a shale break then it will be possible to shut off this streak by means of suitable packers and the location of injection wells can be determined without regard to the porous layer.

Investigate History

After the subsurface conditions have been determined it is advisable to investigate the history of the area in regard to its past production. As a rule the sand will be fairly depleted of its oil that is normally recoverable. If such is the case then it will be difficult to inject large volumes of gas into individual wells or to operate at the high pressures necessary to drain the tight sands without at the same time by-passing most of the gas through the loose sand. For this reason, repressuring a pool in its later life is usually restricted to the use of lower pressures than if pressure maintenance had been practiced from the beginning.

Use of High Vacuum

If accurate production data are not available it is often difficult to determine the extent of depletion of the sand since there is no way of telling what amount of gaseous space may exist above the oil sand. Normally if such a space exists, the early production of the field would have shown a high gas-oil ratio. In such cases it is often necessary to proceed by trial and error methods in repressuring. A test which may easily be made[5] consists of the application of a high vacuum to the casingheads of some representative wells for a few days which, in effect, is the same as applying a pressure differential of about 14 pounds per square inch between input and producing well. If a noticeable increase in oil production takes place upon application of the vacuum, it may be assumed with reasonable assurance that the property will respond to repressuring. Unfortunately, however, the converse is not true, that is, no increase in production does not necessarily mean that repressuring will be unsuccessful. It may merely show that the sand is too tight to respond to such a small pressure differential but will yield to higher pressures. Obviously the test will only prove whether the area will respond readily to low pressures.

Type of Drive Important

A knowledge of the original expelling force is useful. In a majority of cases the oil is expelled for the most part by gas. Some fields have a combination gas-water drive while a few have hydrostatic drive only. In the latter case, repressuring would probably not be advisable. If the expellent was both gas and water then repressuring should proceed with caution and only after the location of the edgewater was determined for the reasons mentioned previously. If the rate of water encroachment has been slow then repressuring may be successful in further retarding the rate without trapping off any oil sands.

If accurate well records have been kept it will be simple to determine the efficiency with which the original expelling force has been used. If a field shows a very high gas-oil ratio it may show that the oil sand was associated with a porous gas sand. In such a case it may be expected that in repressuring the sand a similarly high gas-oil ratio will result so that a large volume of gas must be injected. If the field is producing at the time the repressuring is contemplated then the gas-oil ratios should be noted and an effort made to keep them as low as possible so as to keep the pressure of the field at a maximum and conserve the gas.

How Much Is Left?

Probably the most important consideration in repressuring and the one in which the operator is most interested is the amount of oil left in the sand and the relation of this amount to the original volume of oil. The most effective and most dependable method of determining the amount of oil remaining in the sand is by taking cores of the sand under question. This procedure is usually expensive and may necessitate the drilling of new holes to obtain the cores. After representative cores of the area have been drilled, they should be sealed in air-tight containers so that none of the lighter hydrocarbon will evaporate. The residual oil may be removed in several ways, care being taken that none of it is lost. One method makes use of solvent extraction, after which the solvent and oil are separated by fractional distillation. Another means of measuring the volume of oil is known as the retort method. Here the core is broken up into pieces about the size of walnuts and these are placed in a retort which is then sealed tight except for a tube which comes from it. This tube leads to a water condenser at the bottom of which

is a graduated receiver. The retort is heated very gradually for at least half an hour or until the amount of oil distilling over is small and finally just below a dull-red color. The oil and water which are in the core will be distilled off and condensed into the graduated tube where the volume of each can be read. By knowing the volume of the core used and the volume of oil from this core, it is simple to calculate the amount of oil left in the sand. However, one error in this method lies in the fact that if the retort is heated too strongly, some of the oil may be cracked to form gases which cannot be condensed. Thus the amount of oil in the graduate will have to be corrected in order to arrive at the actual volume in the core. The method has one advantage in that the amount of water in the sand is determined along with the oil. If enough cores have been taken over the field so as to be representative of the producing sand, then it can be determined whether or not the sand contains enough oil to justify the repressuring project.

When Cores Determine Porosity

If the cores have been taken in consolidated strata they may be used to determine the porosity and permeability of the sand. Porosity may be determined on a basis of total porosity or effective porosity, the latter being what is generally desired. Effective porosity is the percentage volume of connecting pores or capillaries to the total volume of the sand. The porosity may be determined by a variety of methods. If the pore volume and the volume of oil in the sand are known then the percent of saturation can be calculated. The degree of saturation of the sand is important because if the sand has a low oil saturation it means that the pressure medium will have a greater tendency to flow through the stratum without forcing oil along with it; in effect, the gas by-passes through the poorly saturated pores. If a sand contains a large total volume of oil but has a low saturation, that is, a low percentage of oil volume to pore volume, then it is very likely that repressuring will be less productive than in a sand containing less total oil but a greater saturation. The permeability of the sand is important as an indication of its resistance to injected gas. Thus a sand having a low permeability will require a higher injection pressure than a sand of high permeability.

General Condition of Property

Along with an investigation of subsurface geologic conditions and porosity, permeability, and saturation of the sand must come an investigation of the general condition of the property. If the field has been shut down for some time, it will be probable that the wells cannot be used without repair to casing and tubing as well as other equipment. Care should be used in inspecting the injection wells to make certain that the producing sand is effectively shut off from the strata above and below it so that none of the injected gas will be lost. In the case of very old fields it is usually advisable to drill new holes for injection purposes rather than repair the old ones. Badly worn casing or tubing in all wells should be replaced and all well fittings should be tight so that there will be no leaks. Often the wells will require cleaning out before the repressuring begins. The face of the producing sand in the injection well must be cleaned thoroughly so as to offer as little resistance as possible to the gas. There are a variety of methods for cleaning out the input well. The favorite method is by means of cable tools employing a bailer. Other methods used are: "(1) swabbing, followed by bailing; (2) using a sand pump to lift the heavy cavings, followed by washing out and bailing; (3) washing the hole with oil; (4) shooting, followed by bailing; (5) blowing out by compressed air or gas."[1] If the well is an old one located in a tight sand or hard formation, or if the face of the producing sand is coated with paraffin or lime it is often shot before being converted into an injection well. Wells that are newly drilled or those draining unconsolidated sands should not be shot.

Repressuring Methods

Now that the problems of pressure restoration and pressure maintenance have been discussed in relation to field conditions, it will be well to view briefly the actual methods of repressuring in regard to physical equipment, means of applying pressure, and pressure medium.

The equipment used in repressuring consists essentially of the apparatus for compressing the medium and transferring it from the compressor to the input well. Naturally the size and capacity of such equipment will be dependent on the volume and pressure of the gas to be injected so no empirical pattern can be set up for the construction of a typical compressor unit. In some cases it has been found that a complete repressuring station can be assembled for $4000 or less.[6] This consisted of a two-stage compressor driven by a 40-50 horsepower oil engine, serving 41 wells. If an adequate supply of natural gas is available, the fuel cost for running the compressors will be almost negligible. Diesel or gas engines and steam engines are often used as the prime movers. Pressure lines should be able to safely withstand operating pressures.

Use of Compressors

Compressor stations are sometimes operated in conjunction with stripping units when it is desired to remove the higher hydrocarbon fractions from a wet gas. In any case, the size and type of construction will vary for each project and to meet each need. Sometimes it is necessary to estimate just what size unit will be required. This may sometimes be accomplished by a study of the thickness of the sand, degree of saturation, formation pressure, past oil and gas production and area to be drained. More accurate information may be acquired by means of a portable compressor, if such is available, to determine how much gas can be forced into each well, and at what pressure. One company made tests with a portable compressor to determine the injection pressure and then arbitrarily assumed the value of 10,000 cubic feet of gas per day for each foot of oil sand as the amount to inject into each well. Multiplying this value by the number of input wells gave the total volume of gas required and the plant was built to supply this amount.[1]

Supply-Line Hook-Ups

The type of supply-line hook-up depends on what the engineer has found most successful for the field repressured. Some prefer the loop system for distributing gas which is analogous to a parallel hook-up in an electrical circuit. It is cheaper than the header system and is

thought to cause less trouble due to freezing on low pressure lines. In using the header system, in which there are separate lines to each input well from a header at the compressor plant, the volume of the gas and the pressure at which it is injected can be controlled more efficiently. Where the injection pressure is greater than 800 pounds per square inch it is advisable to use a direct discharge line from the compressor to input well since the control of high pressure gas by means of valves is difficult; nor can the gas be metered satisfactorily. In such a case the gas can be controlled and metered at the suction end of the compressor. Likewise, if certain wells take gas at a higher pressure than others, it is best to run direct lines from the compressor to these wells rather than compress all the gas to the pressure of the highest input well and then allow most of it to expand to the low pressure required by the other wells.

Volume vs. Pressure Input

Most engineers prefer to operate on a uniform volume input per well basis rather than a uniform pressure per well basis.[1] This is explained by the fact that it is easier to control the distribution of gas by means of a uniform volume input and it also affords a better check on the migration of the gas. Operating under uniform pressure is more difficult because it is seldom that the sands are uniformly tight or loose and formation pressure may vary considerably even over a small area. At the same time, some engineers believe that there is a definite relationship between the volume of injected gas and the amount of oil produced, so that to maintain this relationship, a uniform volume of gas should be injected.

Handling By-Passing

In discussing the difficulties encountered in repressuring, frequent mention has been made of the fact that gas was likely to by-pass the oil or form channels so that it flowed easily from input to producing well without functioning properly in removing any oil. If such by-passing or channeling is found, there are certain operating practices, which can alleviate or remove this condition. One method is by placing back pressure on the producing well, which can be accomplished by a restriction in the flow line from the well or by maintaining the pressure in the oil and gas separators. The pressure can also be increased by raising the fluid level in the producing well, either by raising the tubing or by changing the length of pump stroke or the number of strokes in a given time.[2] The point at which perforations in the tubing are set and the location of flood nipples will also help to maintain the fluid level.[1] Some wells are equipped to produce only a fixed volume of gas and pressure is maintained in this way. In many cases the wells are shut in entirely for a few months until the pressure has built up sufficiently to prevent by-passing.

Mention has been made through this paper of the term "gas" which is used synonomously with "pressure medium." For the most part, there are three pressure media in general use: natural gas, air, and a combination of the two. Whenever it is possible to secure an adequate supply of natural gas, then this medium is used to the exclusion of all others. Air alone is sometimes used and quite often a combination of the two in various proportions is used where there is only a small supply of natural gas at hand. The relative advantages and disadvantages of each medium will be subsequently discussed. In some isolated cases, exhaust gases from the engines have been injected into the well as the pressure medium, but there has never been any record of large scale repressuring by means of exhaust gas or of success on a small project. For the most part, exhaust gases offer so many disadvantages that they are never considered.

Physical Principles of Movement

By knowing the physical principles upon which compressed air or gas moves the oil through the sand one is in a better position to understand the effect of air or natural gas in accomplishing the purpose. These principles may be briefly summed up in three parts: (1) the oil is moved because of the direct pressure of the medium behind it, acting as if it were a piston forcing the oil through the cylinder; (2) the medium goes into solution in the oil near the input well and then expands near the producing well. By so going into solution it changes many of the physical characteristics of the oil; (3) the medium carries off oil in the form of vapors or oil films around bubbles of the gas. If any of the gas comes out of solution it has a tendency to form bubbles which may carry oil to the surface.[2]

(To be continued in an early issue)

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INSTALLING

Large Engines

ON PIPE LINE STATION

Foundations

BUILT FOR SMALLER ONES

By ELTON STERRETT, Engineer

WHEN a realignment of ownership following a merger made it necessary for a pipe line subsidiary to transport 50 percent more oil than its former rated capacity, two comparatively short loops took care of the "bottleneck" sections in the main line and provided a fairly uniform hydraulic gradient under the new load requirements.

Plunger Areas Increased

Securing the additional pumping capacity, however, seemed to involve the erection of a supplemental pump station to house the two new internal-combustion engine driven triplex plunger pumps to be added to the four of the initial set-up. The earlier station was so hedged about with tanks, equipment and other structures that there was no room for a bay or extension to the building. A check-up of the pumps showed that they could readily be changed over to provide the enlarged capacity simply by withdrawing from service the 4¼ x 24 inch plungers and re-equipping the existing pumps with plungers 5¼ inch in diameter. This change would increase the effective area per plunger from 14.186 to 21.648 square inches, or almost exactly the desired 50 percent increase. And, as the pump bodies had originally been designed to carry and satisfactorily pack off up to six-inch plungers, this part of the change-over could be quickly and easily made.

Power Demand Handled

As under original 4¼ inch plunger conditions the engines had been working close to full load rating, additional power would be required to drive the enlarged pumps. This was to be supplied by removing, one at a time, the four original three-cylinder engines and replacing them with four-cylinder units from the same manufacturer.

In preparation for the work-over a tandem centrifugal unit, motor driven with purchased current, was set up in the station yard and used to increase throughput as well as carry the load normally allotted to the unit being overhauled.

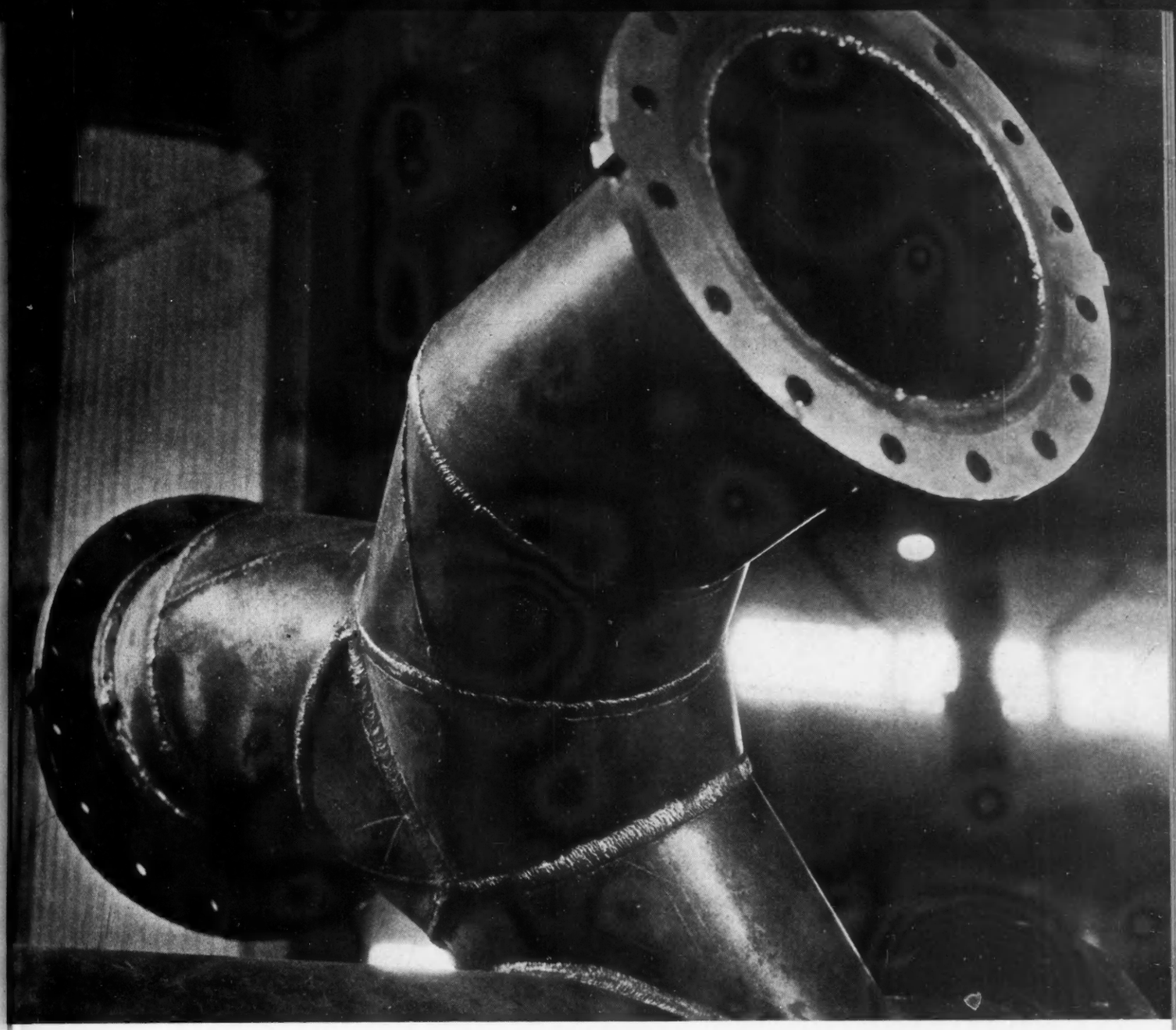
Foundation Too Small

Since these new power units were designed to have as far as possible the same major dimensions as the three-cylinder model—being built with identical bore and stroke—no change in location of pump, pinion shaft or flexible coupling was contemplated. But, when the new four-cylinder unit arrived, it was found that the simple provision of an addition to the foundation at the end away from the flywheel would not care for the new foundation bolt set-up. The distance athwart the base between pairs of bolts measured 1½ inches more than did the unit removed, and none of the old foundation bolts lined up with the holes in the new frame.

Re-Spacing Bolts

This meant that, in addition to chipping away the earlier bed of grout, cast when the initial units were set, new holes must be drilled in the old foundation and bolts re-spaced to accord with the new specifications.

The layer of old grout came away easily under the urge of a small air-driven chisel, separating from the body of the foundation with very little evidence of having been properly bonded at the time the units were set but, of course, presenting adequate strength against compression. The entire top of the foundation was gone over with the chisel, and the laitance—the frothy, trashy residue



PIPE DREAMS COME TRUE

A typical example of Goodrich improvement in rubber

IT looked like a summer cottage in a rain storm . . . In a cotton-seed processing mill, acid-soaked product had to be transported around the plant in wood troughs, because the acid ruined every other material. But even the wood troughs leaked—pails had to be hung here, there and everywhere to catch drips from the leaks, and a maintenance crew was kept busy repairing the system.

Then a plant official heard about the unusual things Goodrich has done with rubber. He sent for an engineer—and his whole problem was solved, by Vulcalock.

Vulcalock is an exclusive Goodrich process of attaching rubber to metal, with an inseparable bond. It was a simple matter to replace the wooden troughs in this mill with steel pipe, rubber lined. Wasteful leaks were stopped, production was increased, repair and replacement became things of the past.

The Goodrich Vulcalock process has hundreds of profitable applications in industry. It has reduced pickling costs in steel mills. Ball mill linings of rubber, attached by Vulcalock, outwear manganese steel. Tank-car linings, rock-products chutes—all made of Goodrich rubber attached by Vulcalock—have outlasted steel or other previous linings as much as 10 to 1.

And Vulcalock is only one of scores of Goodrich developments made for the benefit of industry. Goodrich belting, hose, packing, molded articles, (32,000 rubber items altogether) are better values because of constant research and development in the product improvement laboratories of The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

Goodrich

ALL *products problems* IN RUBBER

floating to the top of any well-puddled concrete—entirely cleared away and a new surface presented for grouting.

There was ample width to the old foundation to support the new and larger engine base, but it was felt that any attempt to drill the old mass using a hammer and star drill might result in starting cracks along the outer or thinnest section of concrete being penetrated, with eventual cracking there sufficient to release the plug of grout relied upon to hold the bolt in place.

Specially Constructed Drill

Instead of attempting to hand drill the holes, a frame of two-inch pipe was welded together so that it might be clamped in place with dogs held down by nuts on the old foundation bolts. Atop this frame was bolted a motor-driven drill press, provision being made for lateral shifting to center the spindle directly above the holes to be made in the concrete base.

A "rotary" drill was formed from a three-foot section of 2½ inch extra heavy pipe, its lower end cut into a series of saw teeth which were swaged to 1½ times their original thickness and then the sides and edges of the teeth faced with a tungsten-carbide alloy. Then, with a two-inch collar welded to the upper end of the rotary-type drill, and a set of two-inch nipples of varying lengths—threaded on the lower end to screw into the collar and notched at the other for driving by a dog carried on the drill press spindle—it was necessary only to provide a flow of water down within the "drill pipe" for the removal of cuttings and to start the motor.

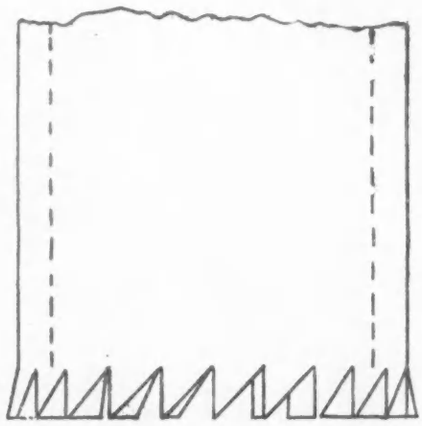
Due to the presence of protruding aggregate at the top of the cleaned foundation, better time was made and the hole prevented from drifting laterally if a shallow circular groove was first chipped by hammer and chisel at the correct location of the bolt hole, and no other trouble was experienced in keeping the hole reasonably straight and true to size.

Drill Around Old Bolts

As the lateral offset on each of the two bolt holes at the corners was only ¾-inch, and the earlier bolts one inch in diameter, it was feasible to run the hollow "drill stem" down over the old bolt, and

FIGURE 1

Method of forming cutter from length of pipe. Edges and sides of teeth are faced with tungsten-carbide alloy.



to cut it out along with th e cylindrical core of concrete.

The new bolts were set in the holes thus drilled, after the cavity had been first blown clear by air and then allowed to soak while being kept full of water for 24 hours.

A slight amount of flexibility was afforded the upper ends of the bolts by encasing the eight inches immediately below the engine base line in steam hose; though, despite the close clearance between bolt and base, there was no severe bending or offsetting of the bolts required, so accurately had the holes been drilled with the improvised "rotary."

Use Eight Leveling Spots

Before spotting the new bases on the elongated foundations, eight levelling "spots" were made

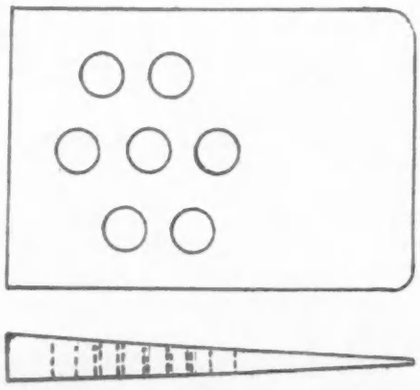


FIGURE 2

Setting wedge with ⅝-inch holes so spaced as to allow wedge to be retracted without disturbing grout.

by setting six-inch squares of one-inch boiler steel in stiff grout and allowing them to set; this to provide a firm support for the pairs of wedges needed to level and align the base preparatory to grouting in place. The steel spots, each carefully levelled in a plane one inch below the lower engine base line, afforded a wide bearing to the wedges, contrasting strongly with the ramshackle cob-house of wedges, shims and scrap metal so familiar around most erection jobs.

Brushed With Paraffin

After the unit was levelled and approved for grouting, the pairs of wedges used adjacent to each foundation bolt were brushed over with a coating of melted paraffin. When it was desired to remove the wedges after the grout had hardened sufficiently, none of the usual hammering of the wedges was necessary, as they could readily be pulled by inserting the end of a pinch bar behind the edge of whatever hole protruded from below the base. The boiler plate "spots" were, of course, left buried and out of sight within the grout.

Equipment Salvaged

Since the cylinders, connecting rods and all parts of the engines above the base were identical, each for each, with the three- and four-cylinder units of identical bore and stroke, it was necessary to purchase only one complete four-cylinder unit, and then to build up the following three upon new bases and crankshafts, using the rods, cylinders, liners, valve motion and other gear salvaged from the three-cylinder units being supplanted.

Use Old Flywheels

Merely for the sake of station uniformity, the initial four-cylinder unit secured was ordered with a flywheel of the size normally furnished with the three-cylinder unit, though the larger engine, with more frequent power impulses at the same operating speed, did not actually require—nor was it usually equipped with—as heavy a wheel as the initial units. Changing this specification enabled subsequent rebuildings to incorporate flywheels already on hand, and did not in any way affect the connection between prime mover and stub shaft to the flexible coupling.

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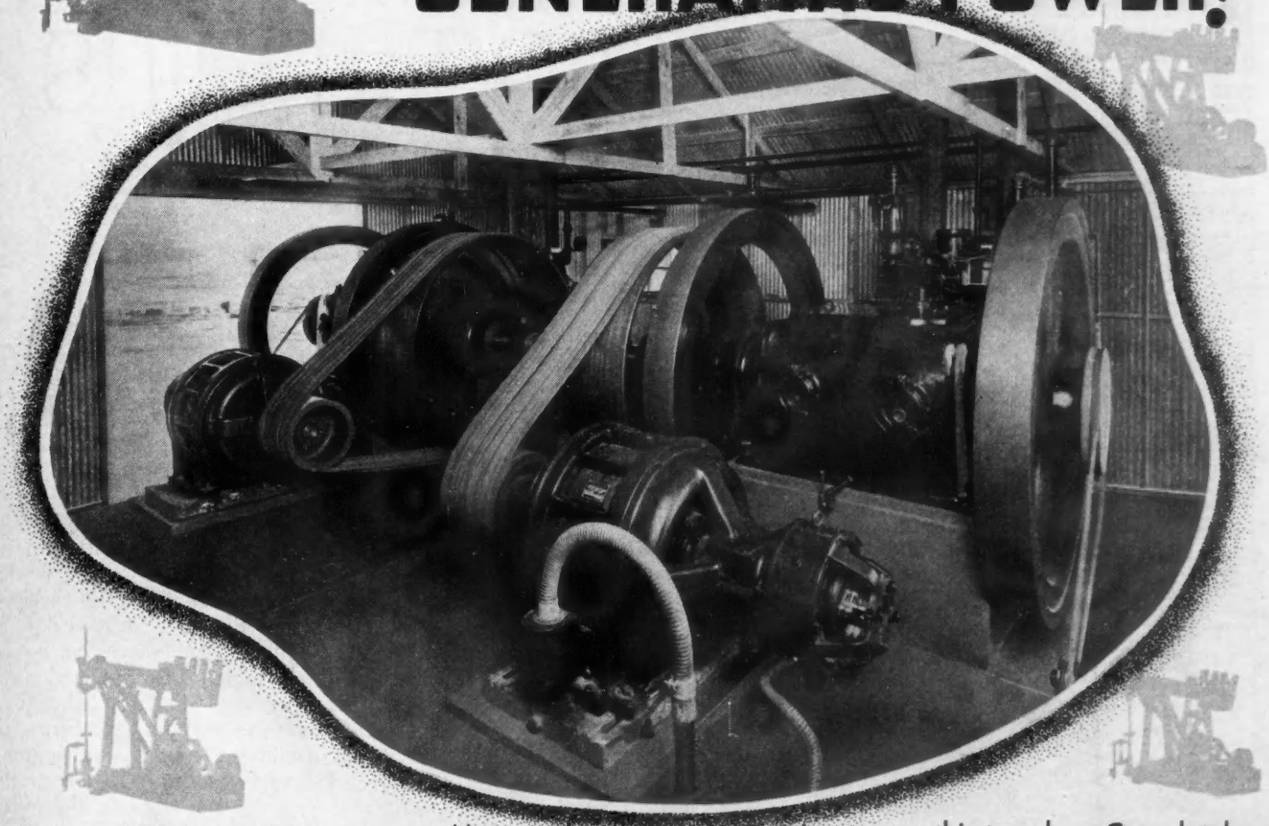

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THE Correlation METHOD OF Seismographing FOR OIL

By SYLVAIN J. PIRSON
Head, Petroleum and Natural Gas Engineering Department, The Pennsylvania State College, State College, Penna.

IN a previous article (THE OIL WEEKLY, April 26, 1937) concerning the dip-shooting method as applied to the survey of prospective oil bearing territories, the principles underlying the generation of elastic waves by the explosion of a charge of dynamite confined at the surface of the ground were stated briefly. It was noted that the impingement of the elastic waves at the boundary surface separating media of contrasting velocities of propagation produced a split of the engergy in refracted and reflected energies of different vibration characteristics mainly longitudinal and transversal. For all practical purposes longitudinal waves, which travel at a higher rate of speed, are the only ones used to date in the interpretation of oil seismographic data, although there is a possibility that transversal waves will be used in the future for weathering correction calculation and possibly for the study of porosity and degree of bed consolidation. By a suitable arrangement of the receivers or geophones at the surface of the ground, it is possible to pick up the reflected longitudinal waves at a time when the refracted energy, which has traveled along shallow elastic discontinuities, has died out, thus indicating a distinct burst of reflected energy. Since the sedimentary formations in which the petroleum accumulations are found, are commonly made up of alternating and laterally continuous hard and soft formations, it is possible to obtain from the surface, seismic records which will show a succession of reflected bursts of energy and furthermore the general appearance of immediately neighboring records will be alike. In all, the seismograms obtained by correlation shooting are comparable to driller's logs, which it is necessary to shift and line up according to their most probable correlation. The latter, in the minds of different geologists, may assume varying degrees of certainty. Therefore, it appears that unless the records are of an exceptionally good quality the results of correlating seismic shooting are essentially of a qualitative nature, the degree of uncertainty being inferred from the unorthodox geologic appearance of the final subsurface contour map.

Figure 1 is a reproduction of a seismic record ob-

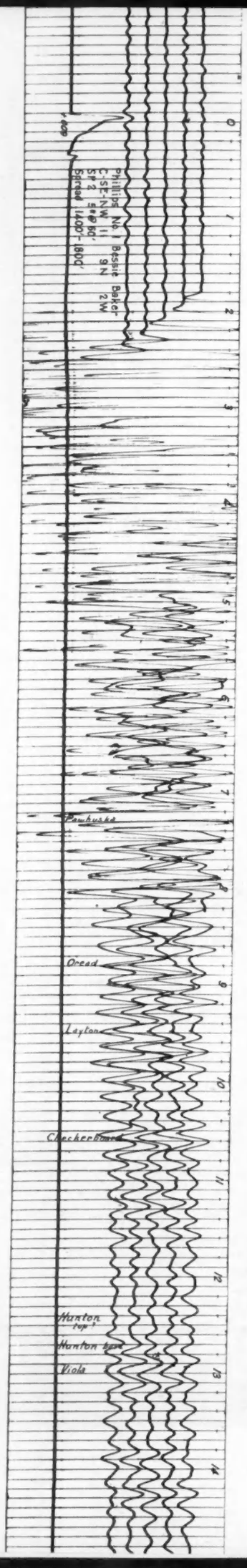

FIGURE 1. Seismic record showing successive bursts of energy.

TABLE 1

Formations	Age	Time of First Large Amplitude, Seconds
Pawhuska Limestone	Upper Pennsylvanian	.730
Oread Limestone	Upper Pennsylvanian	.889
Layton Limestone	Upper Pennsylvanian	.958
Checkerboard Limestone	Middle Pennsylvanian	1.062
Hunton Limestone	Devo-Silurian	?
Viola Limestone	Upper Ordovician	1.309

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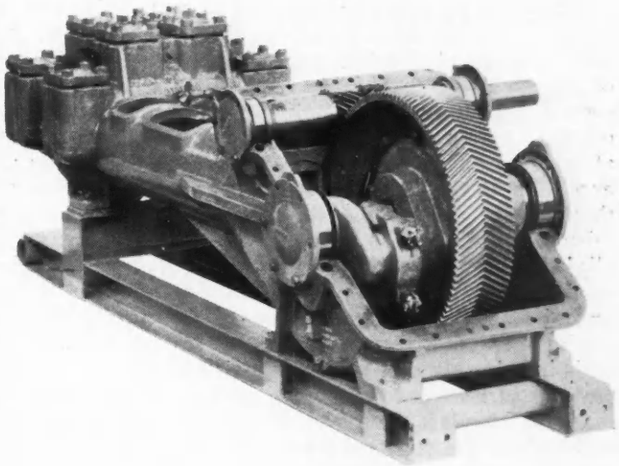

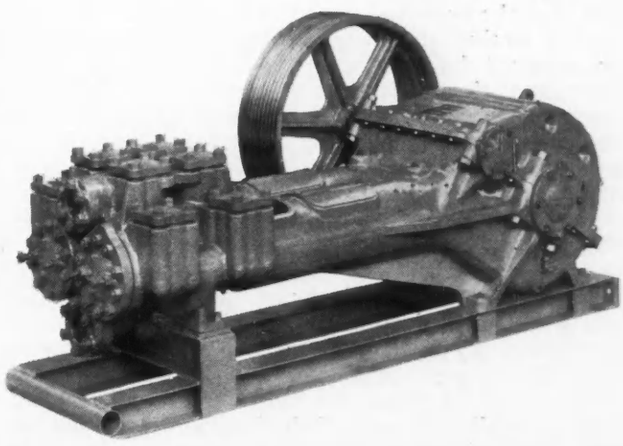

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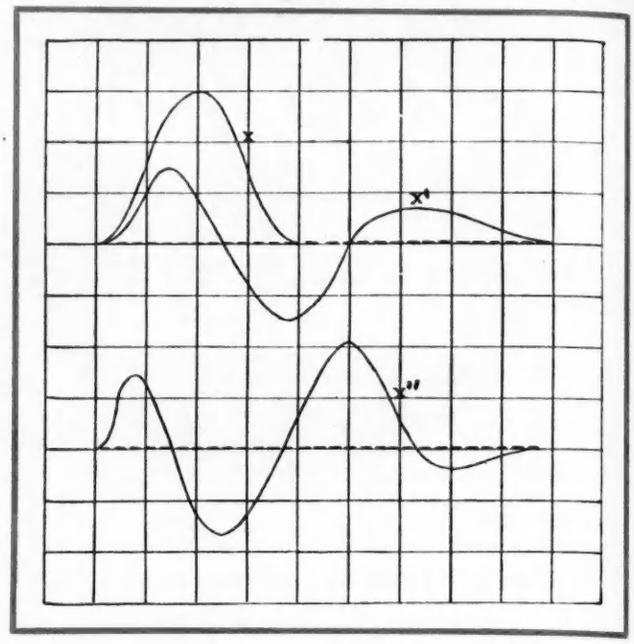

FIGURE 2. Curve x" pictures reflection showing good character

tained in Oklahoma, about four miles north and three miles east of Norman. One notices successively the bursts of reflected energy appearing at varying times and corresponding to the beds listed in Table 1.

One may notice that the reflections corresponding to the massive limestone are made up of bursts of energy which oscillate at the most during an interval of time equal to two periods or about .040 second. This must be compared to the duration of the shock produced by the explosion, which reaches its maximum stress at the end of an extremely short interval of time, at the most .001 second, which stress is gradually released as the gases of the explosion are gradually escaping into the atmosphere. The mechanism of wave generation by an explosion is not well understood, and two schools of thought are opposing each other: one interprets the seismic phenomena as the generation of a sound wave slightly damped which would be propagated in the earth in a similar fashion as the transmission of a sound wave in air; the other advocates the theory that the explosion generates a pressure wave which induces the beds into highly damped oscillations similar to the vibrations of a loaded diaphragm such as in the telephone receiver. This last theory, in the light of results obtained which show the reflected energy limited to two cycles in general, seems to be furthermore substantiated by the fact that the explosion impact is of short duration. According to the latter theory in Figure 2, Curve x shows the assumed deformation of the reflecting horizon as a function of time. It is necessary, however, to justify the change in abruptness of the wave front; this can be explained simply enough by the representation of the explosion impact at the surface by a Fourrier Series of successively higher frequencies. As the wave travels down to the geologic formation, absorption produces a reduction of the individual amplitude proportional to the square of the frequency. Since the abruptness of the wave front is mainly made up of high frequency components it is justified to postulate curve x as representative of the impact on deeply buried reflecting beds. The receivers commonly employed have a dynamic characteristic response such that x' represents the corresponding displacement of the inertia mass of the system. The majority of commercial instruments furthermore make use of the electrodynamic principle in order to transform the mechanical displacement into electric impulses, it is thus necessary to take the first derivative of curve x' in order to obtain the movement of the oscillograph which is finally recorded on photographic paper. Curve x'' so obtained strikingly pictures what is known in the seismographer's language as reflection showing "good character."

Field Operations

The field procedure used in correlating seismograph work is relatively simple. A series of detectors are strung in a surveyed line (for elevations and distances) passing through the shot-point. The separation between detectors is commonly of the order of 50 to 100 feet although it may attain as much as 250 feet. The distance from the first geophone of the spread to the shot-point varies a great deal according to surface conditions. The shortest distance is a function of the ability of the surface formations to transmit disturbances commonly known as "ground roll" which travels with a definite speed and the geophone locations must be such that this disturbance arrives before or after the time of arrival of the reflections sought for. Too short a distance to the shot-point is not advisable on account of the disturbance produced by the slush of mud and rocks projected out of the hole after the explosion. Considering the geometry of a reflection profile where

X is the distance in feet from the shot-point to the middle geophone,

Z is the depth in feet below a reference plane (datum),

V is the overall velocity of transmission of the seismic disturbance through the stratigraphic section,

T is the overall time which the wave takes to travel from the explosion point to the average geophone,

The following formula expresses the relation existing between the different quantities:

$$(VT)^2 = X^2 + 4Z^2 \qquad (1)$$

This expression does not take into account the curvature of the path due to the velocity gradient with depth. But for all practical purposes, it is sufficiently accurate since larger causes of errors occur in the calculation of depth as we shall see later.

The quantities entering into the above equation are measured to a relatively high degree of accuracy: X within one foot, T within one thousandth of a second and V within some 10 feet per second. Solving for Z one obtains

$$Z = \tfrac{1}{2}\sqrt{(VT)^2 - X^2} \qquad (2)$$

which theoretically could be calculated with an accuracy of 15 feet. However, numerous other causes of error such as phase changes and interference enter the computations and it is not normally possible to calculate and predetermine depth to geologic formations with a greater accuracy than ±40 feet. Relative depths between two adjacent points of similar surface conditions may be known with a great deal more accuracy (i.e. ±5 feet). Similarly if the survey is tied onto known wells in which formation tops are accurately known, a great de-

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gree of confidence may be placed upon depth calculations.

The main causes of error requiring correction in correlation seismograph surveys are the following:

(a) Velocity gradient over large area.
(b) Angularity correction.
(c) Anisotropy correction.
(d) Weathering zone correction for multiple layers.
(e) Elevation correction.
(f) Ground roll elimination.
(g) Variation of the "character" of the reflections correlated.

Propagation Velocities

The velocity of transmission of elastic disturbances into the sedimentary formations is a function mainly of their lithologic nature, degree of consolidation, depth of burial and metamorphism.

The velocity in shale is much less than in limestone beds and these two types of sediments offer the best example of contrast. Velocity in shale, according to its degree of compaction, may vary from 6,000 to 13,500 feet per second. Velocity in massive limestone is of the order of 15,000 feet per second. It is due to the contrast between the elastic properties of shales and limestone that practical reflection seismology is successfully applied to the location of oil fields since they are common types of formations encountered in prospective oil territries. Indeed other types of sedimentary beds offer the necessary density and velocity contrasts in order to obtain reflection of seismic energy as is evidenced by Table 2.

TABLE 2

Formations	Velocity in Feet/Second
Gypsum	10,000
Anhydrite	13,500
Rock Salt	15,000
Chalk	12,000
Shale	6,000 to 13,500
Limestone	11,000 to 20,000
Consolidated Sandstones:	
Siliceous	8,000 to 11,000
Calcareous	10,000 to 13,000
Unconsolidated Sands	3,000 to 6,000

In general the factors affecting the velocity of seismic waves in sedimentary formations can be summarized as follows:

1. The velocity increases with depth of burial and a related corollary is: the velocity increases with the geologic age of the formation. The Edwards limestone of Cretaceous age evidences a velocity of 11,000 feet per second whereas the Viola limestone of Ordovician age transmits elastic waves at a speed of 16,000 feet per second.

2. The effect of moisture and water content is largely a function of the degree of consolidation and of the chemical character of the bonding material.

In unconsolidated formations, loose sands and gravels, the presence of water increases the velocity.

In consolidated formations, sandstone, siliceous or calcareous, the presence of water has normally for effect a decrease of the velocity due to the softening of the cementing material.[1]

3. The greater the density of the rock the greater the velocity. This relation is however due to the influence of the great increase in rigidity of the rocks as their density increases.

4. The effect of porosity is to decrease the wave velocity. This is well illustrated by the alteration of exposed consolidated rocks due to aeration and dissolution by percolating waters. This effect is important in practical seismology since measurements are made above such an altered zone which shows abnormally low velocities varying between 1000 feet and 3000 feet per second. The so-called "weathering correction" takes care of this effect.

The seismic velocity through individual sedimentary formations has thus far been discussed but in the calculation of depth according to formula (2) the velocity V represents an overall velocity through a series of sedimentary beds of varying age, composition and depth of burial. It does not appear practical at the present time to calculate this velocity from the geologic columns by a formula such as the following

$$V = \frac{\Sigma h}{\Sigma \frac{h}{v}} \qquad (3)$$

where h represents the thickness of the individual beds.
v represents the velocities through individual beds.

This should be theoretically possible if sufficient data were available on the law of velocity variations with depth of burial, geologic age and degree of consolidation. There are three practical methods of measuring the overall velocities to a given formation:

1. The refraction method.
2. The reflection method { Accurate Method. / Approximate Method.
3. The direct method.

The refraction method of ascertaining overall velocities besides requiring large expenses in dynamite is inaccurate on account of the numerous steps required in the computation. Each step involves a certain degree of error; the total error being a function of this summation, it is not possible to obtain an accuracy of more than 10 percent whereas one part in one hundred or less is the required accuracy. Furthermore, thin beds of high speed material do not indicate their presence on the travel-time curves. Measurements are further in error due to the high curvature of the seismic refraction rays and they are affected to a large degree by the anisotropy of the sediments.

By means of a long reflection profile it is possible to obtain the overall velocity to the reflecting horizon with a fair degree of accuracy. Longer profiles than normally used are laid out and means of calculating V are available in the literature. McDermott[2] proposed a graphical method which is quite handy. After reduction of the individual times of reflection arrivals to a reference plane by means of the customary weathering and elevation corrections the squares of the corrected time are plotted on coordinate paper against the squares of the distances from the shot-point to the corresponding pick-ups. A straight line is obtained whose slope is the square of the overall velocity. Another solution although somewhat involved was proposed by Roman[3]; it makes use of the theory of least squares but it is doubtful that the results are more accurate than those obtained by the graphical method of McDermott.

One disadvantage of the above methods is that they do not take into account the effect of subsurface slopes; this may affect the results to a large degree especially when the direction of the reflection profile approaches the direction of maximum slope. The latter should be determined previous to velocity determination by means of some dip-shooting work or the following approximate procedure may be resorted to when accurate results are not sought. Two shot-holes in line and symmetrically located with respect to a reflection profile are drilled and reflection records obtained; these are correlated and the average total time T of the desired reflection is noted. The down dip step-out time Δt_1 and

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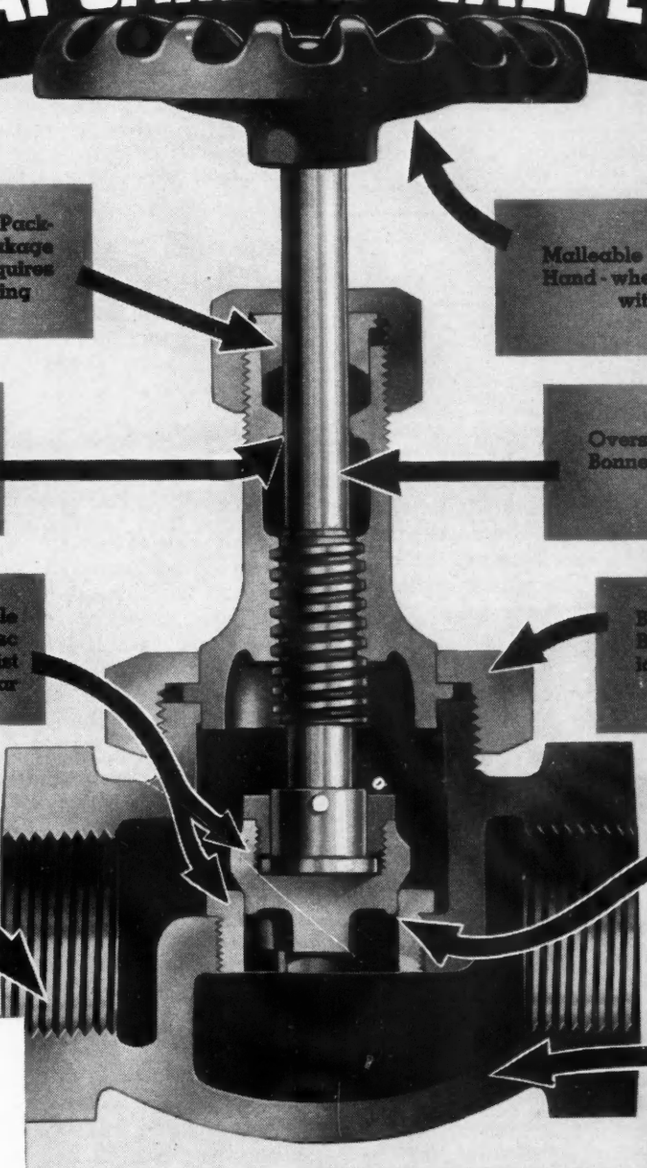

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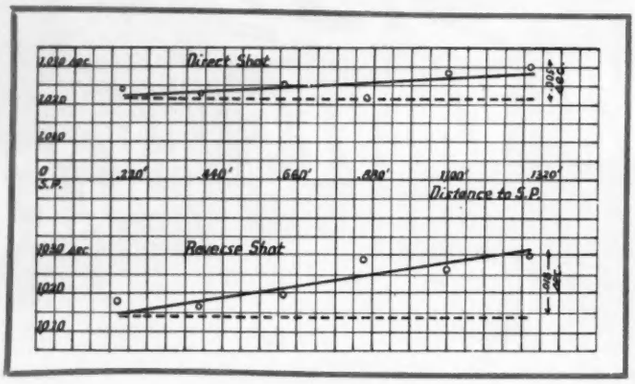

FIGURE 3

the up dip step-out time Δt_2 are determined from the records after customary weathering and elevation corrections according to the following procedure: The arrival time T_n at any geophone is noted and the corresponding summation of the weathering and elevation corrections Σt is subtracted from it. The corrected times $T_n - \Sigma t$ are plotted on coordinate paper against the geophone interval and an average straight line, preferably determined by least square, is drawn through the plotted points, the ti me difference between the extreme geophones of the profile is Δt. The approximate overall wave velocity V is calculated from the following formula:

$$V = \sqrt{\frac{d_2^2 - d_1^2}{T(\Delta t_1 + \Delta t_2)}} \qquad (4)$$

where d_1 is the shot-point distance to the first geophone.
where d_2 is the shot-point distance to the last geophone.
T is the average overall travel time.

An example will illustrate the method.

The data for the following calculations were obtained from a continuous profiling survey done in Oklahoma in Sec. 5, T-23-N, R-4-W where the velocity to the Viola limestone is about 11,000 feet per second. Table 3 gives the results of the correlation, weathering and elevation correction of two interlocking records for a common spread of 220 to 1320 feet with a geophone interval of 220 feet.

TABLE 3

	DIRECT SHOT S.P.I.			RESERVE SHOT S.P.II		
Geophone No.	Time Picks	Weathering and Elevation Correction	Corrected Time	Time Picks	Weathering and Elevation Correction	Corrected Time
1	1.051	—.027	1.024	1.032	—.014	1.018
2	1.047	—.024	1.023	1.039	—.022	1.017
3	1.047	—.022	1.025	1.042	—.022	1.020
4	1.044	—.022	1.022	1.045	—.026	1.029
5	1.043	—.015	1.028	1.052	—.026	1.026
6	1.049	—.019	1.030	1.056	—.026	1.030

Theoretically the curve of the plotted corrected times against geophone separation (Figure 3) should not be a straight line, although for all practical purposes the deviation from a straight line is negligible. The plotting of the correct times shows furthermore a certain degree of scattering from the straight line relationship and in order to calculate the most probable value of Δt_1 and Δt_2 a least square adjustment of the values is advisable. Such a calculation gives $\Delta t_1 = -.005$ second and $\Delta t_2 = +.018$ second. The average overall time $T = 1.025$ second, $d_1 = 220$ feet and $d_2 = 1320$ feet. These values introduced into formula (4) give for the overall velocity to the Viola limestone 11,300 feet per second.

The errors made by the calculation of seismic velocities from the surface by means of formula (4) are unavoidably large although the effect of subsurface slopes are eliminated, which, in the above example, amounts to about 4° on the Viola. Errors of a few thousandths of a second on the values of Δt_1 and Δt_2 may easily amount to 25 percent of the total amount and extremely precise weathering and elevation corrections must be applied in order to obtain accurate results. The theory of error indicates that if the following errors are made on the quantities entering equation (4):

Quantity	*Error*
$T = 1.025$ second	$\pm .005$ second
$d_1 = 220$ foot	± 1 foot
$d_2 = 1320$ foot	± 1 foot
$t_1 = -.005$ second	± 0.001 second
$t_2 = +.018$ second	± 0.001 second

the resulting error in the calculation of V will be of the order 1000 feet per second. Consequently formula (4) permits only a rough approximation of the velocity of transmission. The largest percentage of the error is due to the calculation of Δt_1 and Δt_2 which for accurate velocity determination should be read with an accuracy of one ten thousandth of a second in which case the probable error in velocity determination would be in the above case 104 feet per second. It is possible that with the improvements in seismograph equipment now in progress such accurate measurements of seismic velocities from the surface will be possible in the near future.

The most accurate method of velocity determination, which is also the most commonly used at the present time, is by the process of lowering a geophone down a non-producing well. The depth of the geophone at each shot on the surface may be known accurately by means of steel line measurements, the time of arrival of the seismic wave is known for good records and well designed equipment within one thousandth of one second. The working conditions of well shooting equipment however are often far from being perfect as the writer has experienced and errors of one hundred feet per second in velocity determination are common due to the uncertainty of the time of arrival of the wave front. This method has besides the obvious disadvantage of requiring a bore hole free from disturbances such as cavings, dripping water, gas seepages, etc., which often preclude the performance of satisfactory seismograph well shooting measurements.

Angularity Correction

In making reflection seismograph surveys the center of the geophone spread is in the majority of the cases located at a certain distance X from the shot-point; thus the wave travels on an inclined path and the elapsed time is consequently larger than if the wave was traveling perpendicularly to the reflecting horizon and back again to the surface following the same path. It is most convenient to make this angularity correction as a function of the total travel time T and it can be expressed by the following approximation formula:

$$\Delta t = \tfrac{1}{2}\frac{X^2}{TV^2} \qquad (5)$$

in which Δt is the angularity correction expressed in

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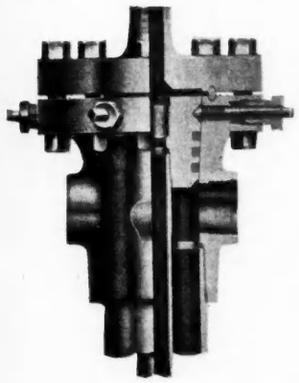

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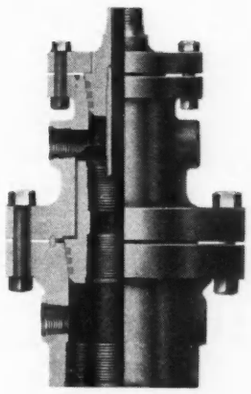

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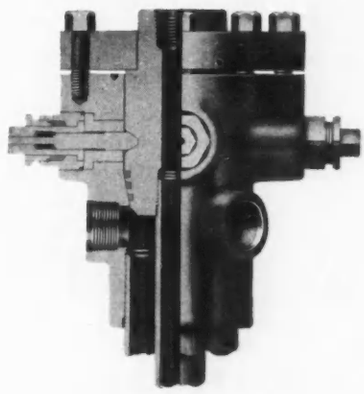
The "HZP" Combination Casing and Tubing Head, designed for use with blowout preventer equipment, provides for complete control of the well while drilling, running and landing casing, drilling in and running tubing. Where it is desired to complete the well under pressure without killing it, the Tubing Head can be furnished with T-segment bolts as shown in the type "HX-10-70" Tubing Head at right, which hold the tubing hanger in the body of the head and while blowout preventer equipment is removed. Complete Christmas-tree assembly built to required specifications, can be furnished with the "HZP" Combination Head if desired. The "HZP" Combination Head is available with hanger to suspend either welded or threaded casing.



TYPE "HX-1070"

6000-Lb. Test

The type "HX-1070" Tubing Head is designed to permit drilling and running tubing through blowout preventer equipment against high well pressure. Tubing is suspended from a hanger which passes through the blowout preventer equipment, seats in the bowl of the body, and is locked in position by T-segment bolts which screw into a slot in the hanger. A split locking ring bolts down over a lip on top of the hanger, replacing the blowout preventer equipment. Hanger is threaded at top for Christmas-tree installation. This head available with bonnet as shown on type "HX-30-01" Head. This Head may be had with flanged bottom for flanging directly to casing head as shown in the "HZP" Combination at left. Hanger, designed for setting packer under pressure, available to fit this Head.

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second and V is the overall velocity to the bed considered expressed in feet per second.

Formula (5) can be graphed for convenience on such a diagram as represented on Figure 4. An example of application of this chart will illustrate better its use. A reflection after application of the weathering and elevation corrections occurs at 1.1 second and the spread X is 1000 feet, the overall velocity to this reflecting horizon is 10,000 feet per second. In order to find the angularity correction one reads the intersection of the ordinates at T = 1.1 and V = 10,000 which gives 2.2. This figure is transferred on the coordinate scale on the right of the diagram and projected horizontally until it meets the 1000 feet line. The horizontal projection from this intersection gives the angularity correction .0045 second. The depth to the reflecting bed below the reference plane is : $\frac{1}{2} \times 10{,}000\ (1.1 - .0045) = 5498$ feet.

Anisotropy Correction

In highly stratified formations the velocity of seismic wave propagation varies according to the obliquity of the path. This is due to the fact that the velocity across the sediments is smaller than parallel to them. As the horizontal component of the seismic path increases, the average overall velocity increases; from these results sediments can be considered as being anisotropic and if velocities in different directions through a vertical plane are represented by vectors, the locus of their extremities are located on an ellipse whose large axis is horizontal and whose ratio to the vertical axis is a function of depth. This ratio known as the anisotropy coefficient varies from one for very deep beds to 1.4 for shallow formations.

These considerations are useful when it is necessary to correlate a long spread with a short one. Oftentimes the depth determinations from apparently well correlating reflections do not check within reasonable limits. The writer has found that the discrepancies could be explained by considering the seismic anisotropy of the formations. In order to simplify the calculations, an anisotropy correction chart (Figure 5) has been devised from which the correction in feet can be read directly. An example will illustrate the use of the chart clearly. Let us suppose that a depth Z of 3000 feet has been obtained from the calculations of a reflection

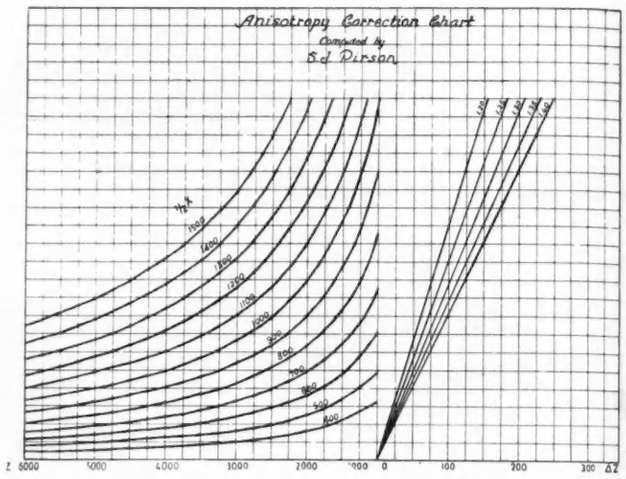
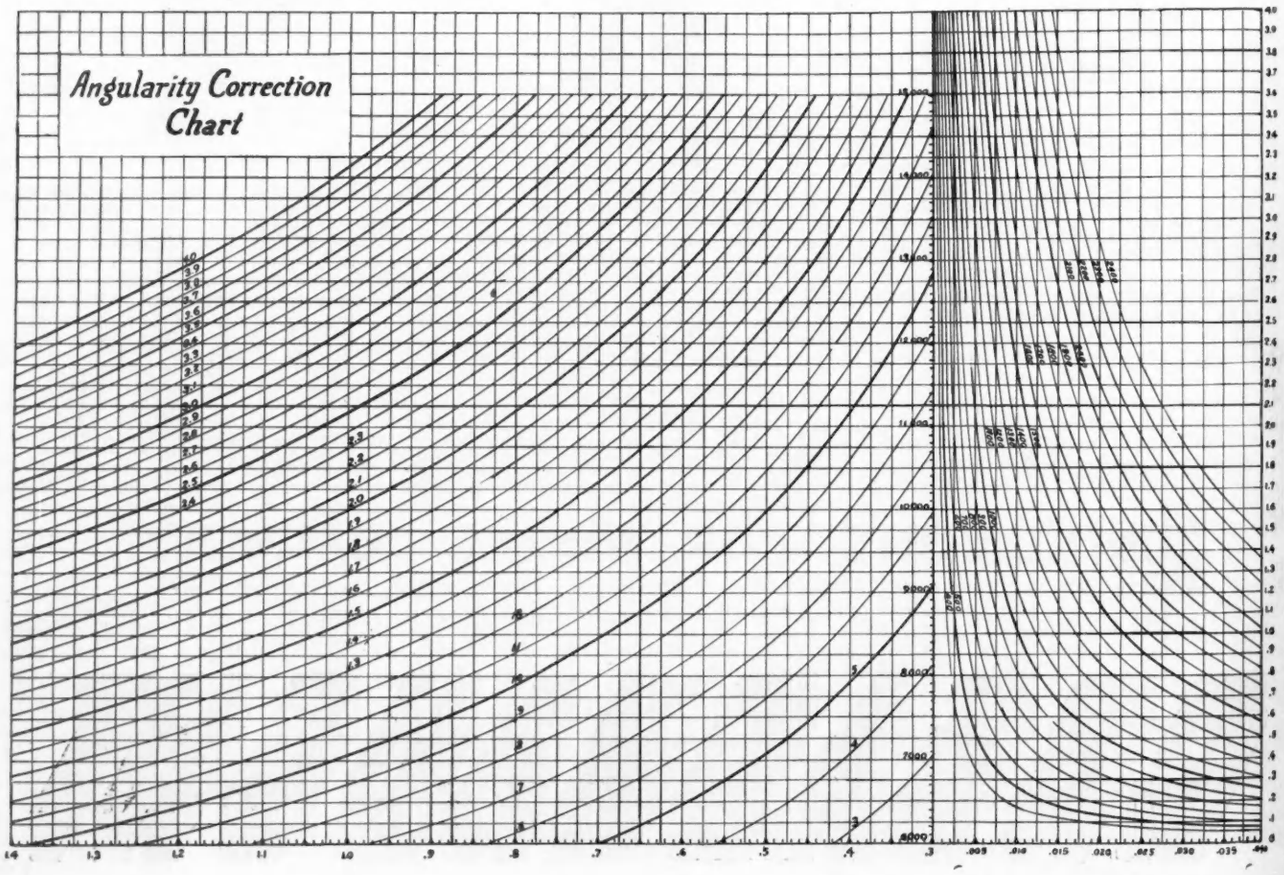


FIGURE 5. At right: Anistropy correction chart to simplify calculations. Correction in feet can be read directly.

FIGURE 4. Below. Illustrates a diagram on which Formula No. 5 can be graphed for convenience.



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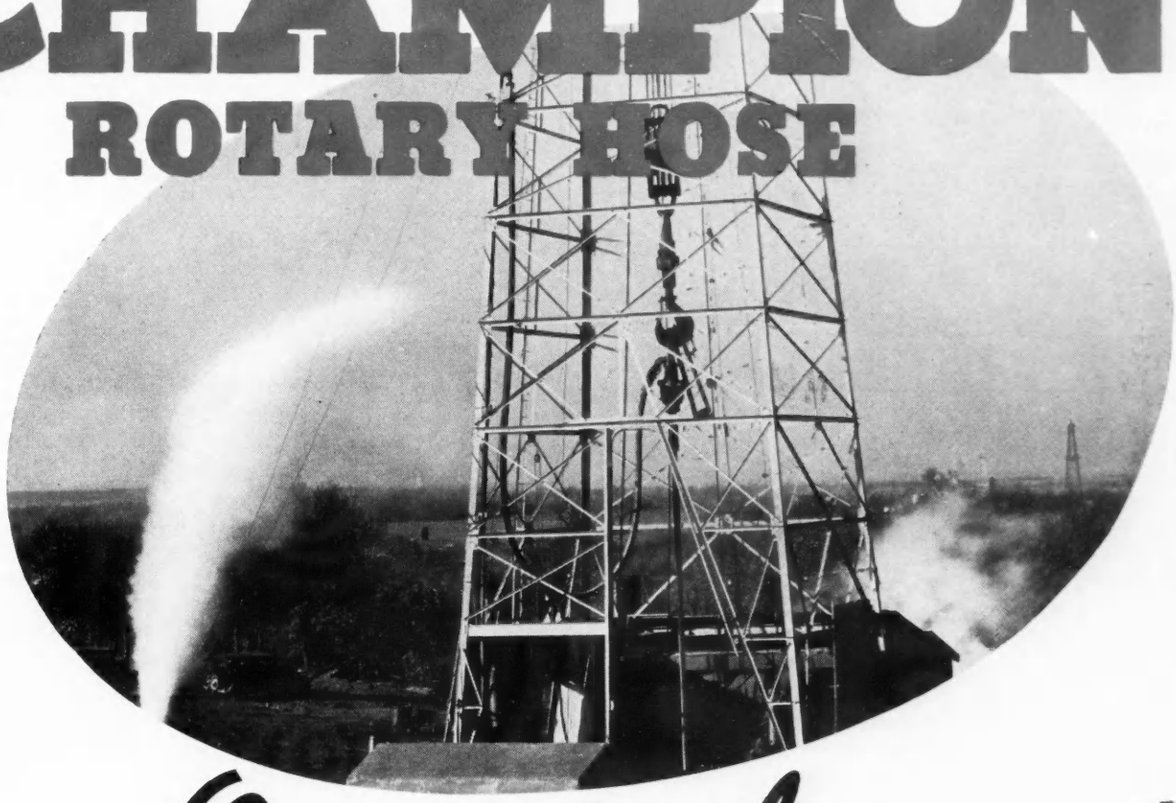

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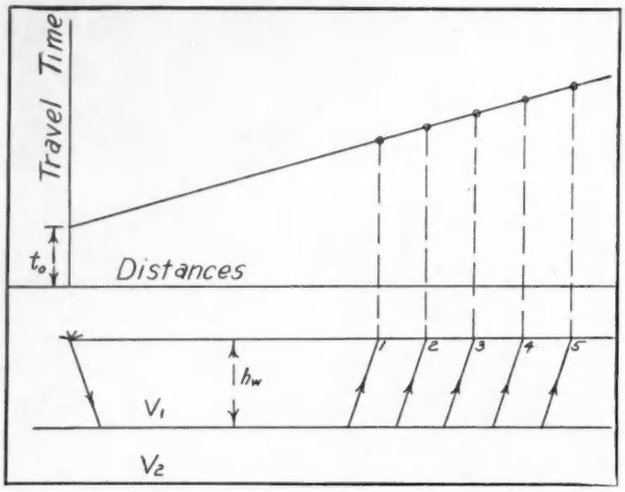


FIGURE 6. ". . . . a refraction travel-time curve is obtained on which the points fall on a straight line."

spread X of 2400 feet and that it is desired to correct the depth Z as calculated to the one which would be found if a spread of 1000 feet had been used. On the left of the chart, at the depth of 3000, the vertical distance between curve 1200 and 500 is obtained and transferred on the ordinate on the right of the chart. A certain anisotropy coefficient is chosen according to depth; in this case 1.3 seems to be quite suitable and a correction of 80 feet is read on the Z abscissa. This correction is positive and must be added to the depth calculated for the long spread; the correct depth is thus 3080 feet. In the case of the reduction from a short spread to a long spread a negative correction is obtained.

One could note in passing, that in dip shooting work where reverse shots are taken, the anisotropy effect is compensated for.

Weathering Corrections

In a preceding paragraph it was noted that the wave velocity in the weathered and aerated surface formations varies between 1000 and 3000 feet per second; underneath the weathered zone an abrupt change in the velocity of propagation of seismic disturbances occurs and the wave velocity may be as high as from 8000 to 10,000 feet per second. Although the weathered zone is relatively thin, large errors in the computation of depth occur due to its abnormally low velocity and consequently careful correction measurements must be made and an adequate calculation procedure must be followed.

Several methods for calculating the weathered zone correction are available and the most common ones will be reviewed. They are all based on the shooting of a refraction profile for each individual spread.

I. One Layer Case

The most common case encountered in the field exhibits only one low velocity surface layer. When the times of first wave arrivals are plotted as ordinate against the respective distance from the weathering shot to the corresponding geophone, a refraction travel-time curve is obtained on which the points fall on a straight line (Figure 6). This line is projected to the ordinate and the intercept t_o, read from the origin of the time scale, is used for computing the average thickness h_w of the weathered material underneath the geophone spread by the use of the following formula:

$$h_w = \frac{t_o\ V_1}{2\ \cos\ \theta} \qquad (6)$$

in which V_1 is the velocity of the weathered material,

$$\cos\ \theta = \sqrt{\frac{V_2^2 - V_1^2}{V_2^2}}$$

and V_2 is the velocity of the unweathered material underneath the aerated zone and is equal to the reciprocal of the slope of the travel-time curve. The weathering correction can either be made in feet of depth below the surface of the ground as expressed by formula (6) or in time as half of t_o in which case it appears as the expression of a delay to the wave propagation. The disadvantage of this method is that it gives but an average value of the weathered layer's thickness underneath the spread without due regard to variation in thickness at the individual geophones. It is however possible to obtain an idea of such variation by considering the deviation of the points through which the travel time curve is drawn. This is oftentimes helpful in correlating across the seismic record when the weathering zone is very erratic.

A further refinement of this method of correction may be obtained by shooting each spread in two opposite directions and taking the average intercepts for the calculation in formula (6).

In order to further evidence the variation of the weathered zones under each pick-up, differential weathering computations may be used. To this effect a direct and reverse shots are taken. When the direct shot is taken, the last geophone of the profile is moved to the location of the reverse shot point as illustrated by Figure 7. It is however, brought back into position for the reverse shot. An example of computation will illustrate more clearly the calculation procedure which is as follows: The time of first arrivals is noted on both records and transferred

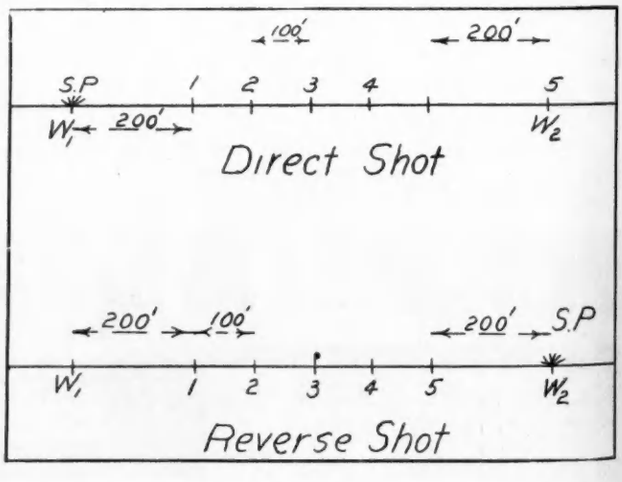
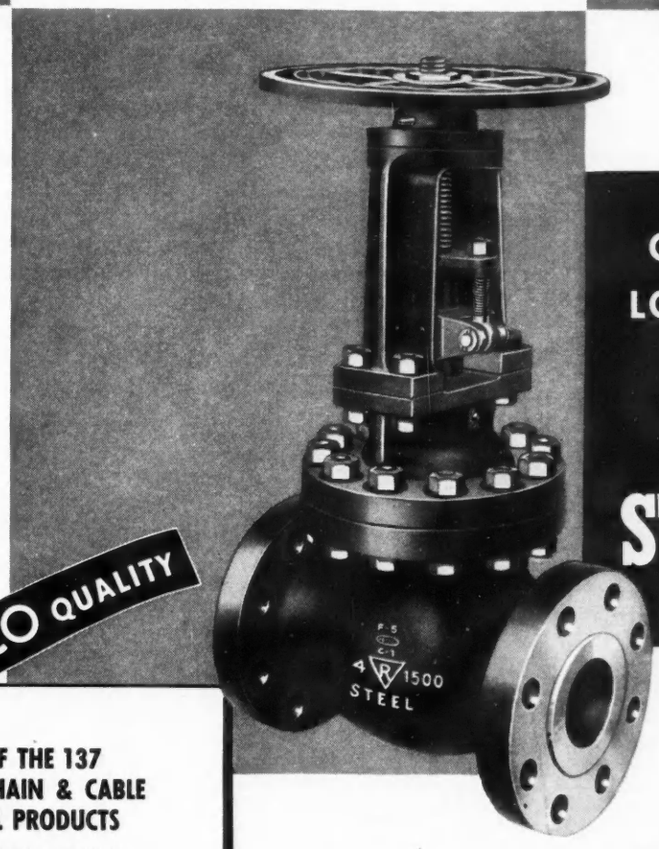


FIGURE 7. "When the direct shot is taken, the last geophone of the profile is moved to the location of the reverse shot point."



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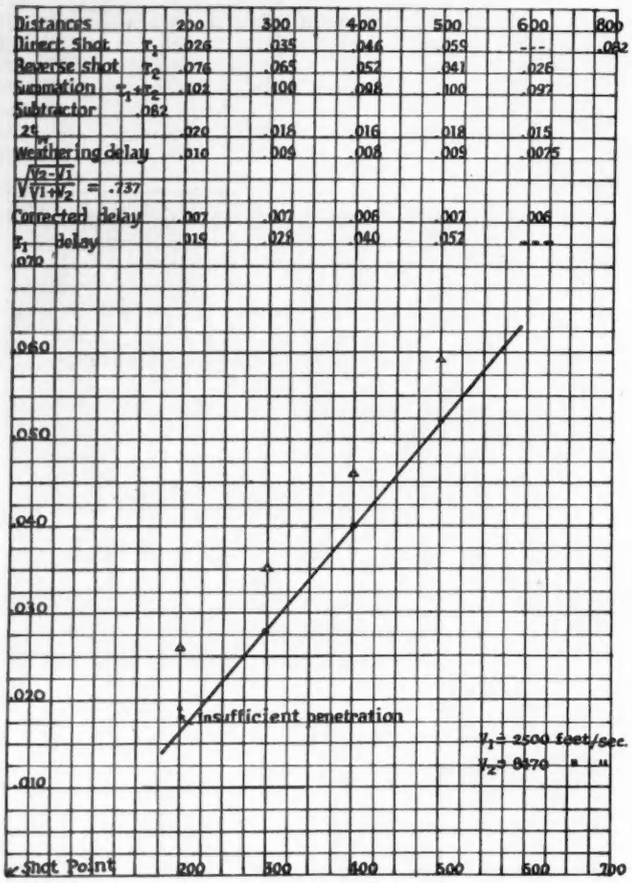


FIGURE 8. The time of first arrivals is noted on both records and transferred into columns as represented in the above illustration.

into columns as represented by Figure 8. The summations are made in lines 4 from which one takes off the subtractor time (.082 second) which represents the elapsed time for the wave to travel from one weathering shot location to the other. A certain time $2t_w$ representing twice the delay in the weathered zone is recorded. In order to obtain the true value of the time of delay in a vertical direction, it is necessary to multiply t_w by a factor

$$\sqrt{\frac{V_2 - V_1}{V_2 + V_1}}$$

in which V_1 is the average velocity in the weathered zone and V_2 is the velocity of the unweathered material directly underneath. V_2 may be read from the travel time diagram of Figure 8 where it is the reciprocal of the slope.

II. Two Layer Case

In certain regions there may be two, and at times several, superposed low velocity zones at and near the surface of the ground. This is especially the case where a well defined water table exists underneath the aerated surface soil and near surface alterated zone. Such a case is represented on Figure 9 where the velocity gradation with depth may be as follows: $V_1 = 2500$ feet per second; $V_2 = 5000$ feet per second and $V_3 = 9000$ feet per second. The relative thicknesses of the two upper zones are not constant over a large area although their relative velocities may remain practically so. It is consequently necessary to make corrections which involve the determination of velocities V_1, V_2 and V_3 and of thicknesses h_{w1} and h_{w2}. The latter are commonly calculated as a function of the intercepts t_{w1} and t_{w2} of the two branches of the travel-time curve obtained by shooting a short refraction profile. The existence of a kink in the travel-time curve is evidence of the presence of two weathered zones when none of the branches passes through the origin. The thickness of the first layer h_{w1} is obtained as in the case of the single layer case by solving equation (6), whereas the thickness of the second layer is obtained by means of the somewhat complicated formula (7).

$$h_{w_2} = \frac{V_2\, V_3}{2\sqrt{V_3^2 - V_2^2}} \left(t_{w_2} - \frac{2h_{w_1}\sqrt{V_3^2 - V_1^2}}{V_1\, V_3} \right) \qquad (7)$$

If one wishes to express the weathering correction in time which represents the total delay in the two zones, this is possible by means of the following relation:

$$t_w = \frac{t_{w_1}}{2}\,\frac{V_2}{V_3}\,\frac{V_3 - V_1}{\sqrt{V_2^2 - V_1^2}} \left[1 - \frac{\sqrt{V_3 + V_1}}{\sqrt{V_3 - V_1}}\,\frac{\sqrt{V_3 - V_2}}{\sqrt{V_3 + V_2}} \right] + \frac{t_{w_2}}{2}\,\frac{\sqrt{V_3 - V_2}}{\sqrt{V_3 + V_2}} \qquad (8)$$

Obviously relations 7 and 8 are too complicated to be practical and some satisfactory means of approximating the corrections have been sought.

A rough approximation is obtained simply assuming that the seismic energy travels vertically downward and induces the high velocity beds into oscillations. This

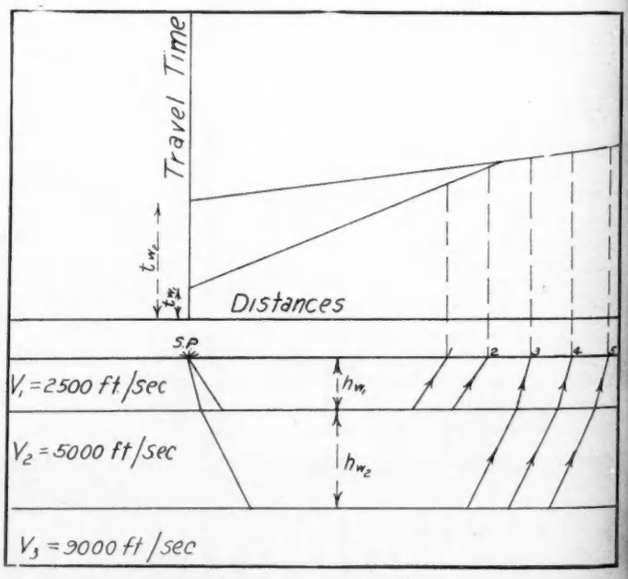
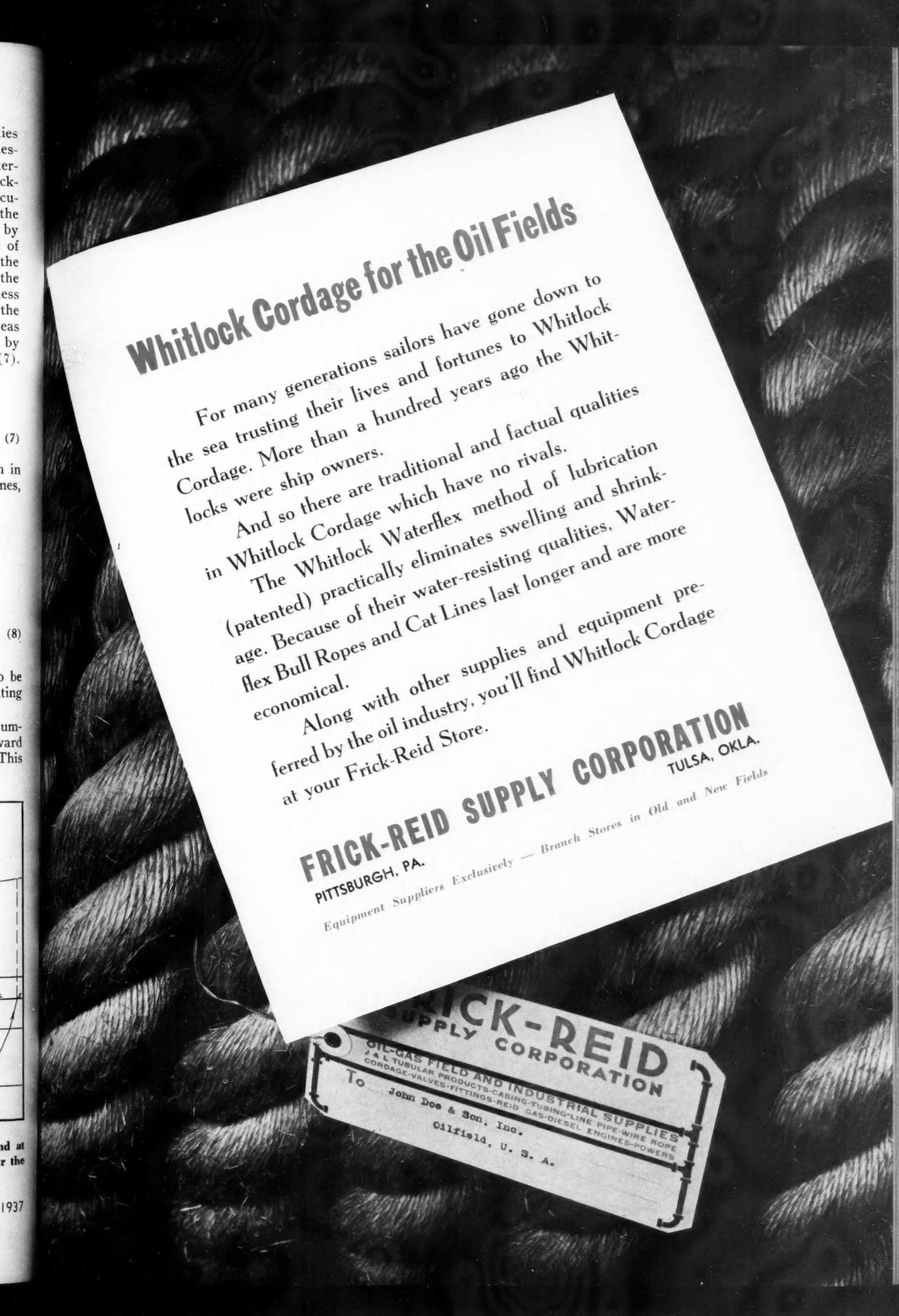


FIGURE 9. "In certain regions there may be two, and at times several, superposed low velocity zones at and near the surface of the ground."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is the hypothesis of Ambronn. In this case the weathering time correction t_w is given by

$$t_w = \tfrac{1}{2}\ t_{w_2} \qquad (9)$$

and the weathered zone thickness h_w by:

$$h_w = \tfrac{1}{2}[t_{w_1} \times V_1 + (t_{w_2} - t_{w_1})\ V_2] \qquad (10)$$

However the hypothesis of the vertical trajectories of Ambronn is not always admitted by the geophysicists and apparently a closer approximation to reality is obtained by the approximation which consists in neglecting V_1 when it is smaller than 50 percent of V_2. In which case the following expressions for the correction are obtained:

$$h_w = \frac{t_{w_1}}{2} V_1 + \frac{t_{w_2} - t_{w_1}}{2}\left(\frac{V_2 V_3}{\sqrt{V_3^2 - V_2^2}}\right) \qquad (11)$$

$$t_w = \frac{t_{w_1}}{2} + \frac{t_{w_2} - t_{w_1}}{2}\ \frac{V_3}{\sqrt{V_3^2 - V_2^2}} \qquad (12)$$

Formulas 11 and 12 can be very easily used by means of the graph of Figure 10 on which the apparent velocity $\frac{V_2 V_3}{\sqrt{V_3^2 - V_2^2}}$ may be read in function of V_2 and V_3. The Time correction factor $\frac{V_3}{\sqrt{V_3^2 - V_2^2}}$ is similarly obtained.

As a means of evaluating the degree of approximation in the different methods of double layer correction an example has been worked out. The intercepted times at the origin of the travel time curve are $t_{w_1} = .010$ second and $t_{w_2} = .020$ second. The velocities are:

$V_1 = 2000$ feet per second
$V_2 = 7000$ feet per second
$V_3 = 10{,}000$ feet per second.

The accurate weathering correction obtained by means of formulas 7 and 8 are:

$t_w = .013$ second
$h_w = 67.6$ feet

The straight vertical paths assumption gives:

$t_w = .010$ second
$h_w = 45$ feet

whereas the approximation method of formula 11 and 12 gives:

$t_w = .012$ second
$h_w = 59$ feet

Elevation Correction

The elevation correction consists in reducing the indicated times on the seismic record by such a quantity that the remaining values indicate the total travel time which would be obtained if the reflection profiles were taken from a plane of constant elevation. This correction, which may be applied either in time or in feet of depth, is positive or negative according to the elevation of the reference plane with respect to the average elevation of the weathering base. The weathering base elevation is the average between the shot hole depth and the base of the weathered zone when the shot hole is deeper than this zone. If this should not be the case a correction must further be applied due to the shallowness of the shot point which takes care of a further delay equal to the weathered zone thickness minus the shot hole depth and divided by the average surface velocity.

The difference in elevation between the weathering base elevation and the reference plane divided by half of th velocity in the layer underneath the weathered

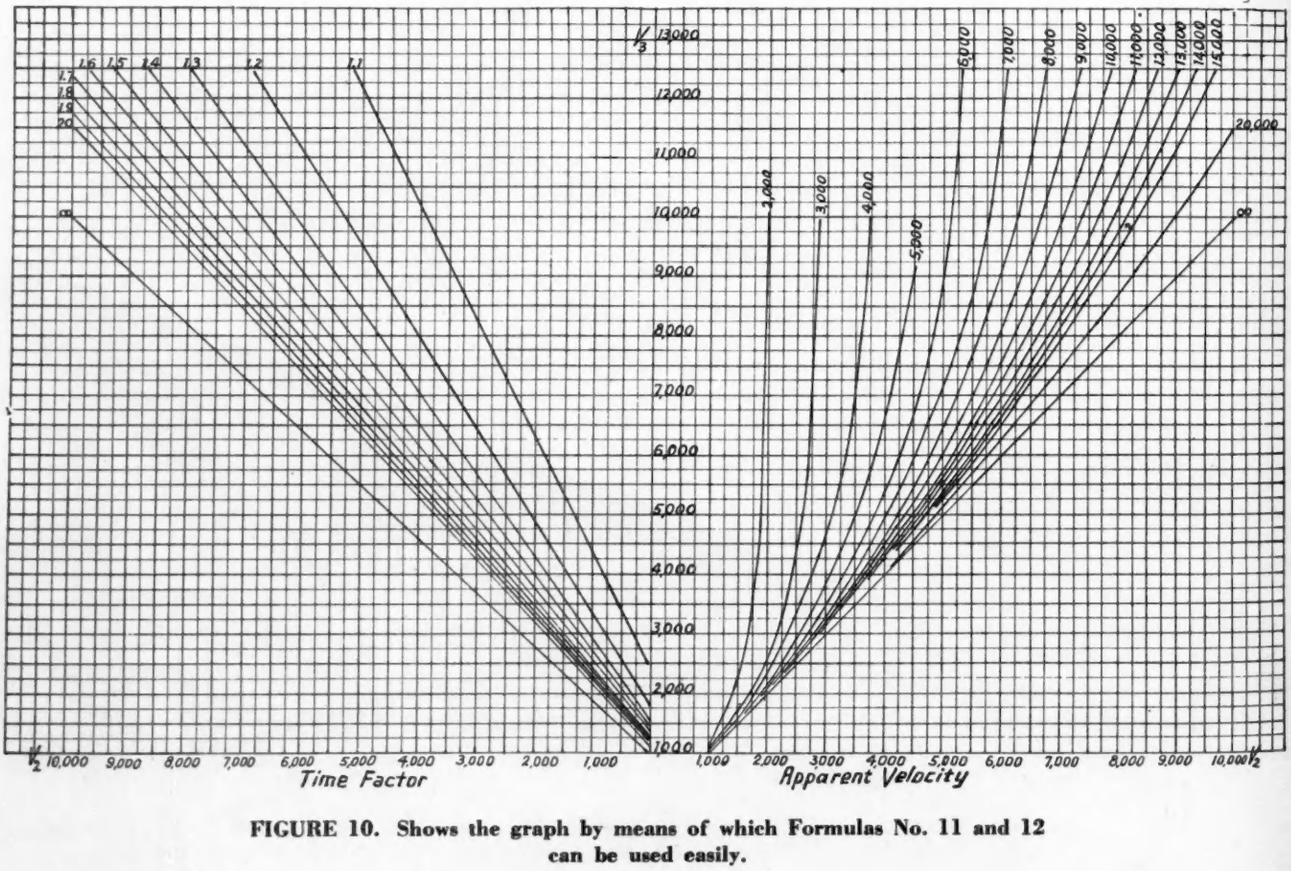
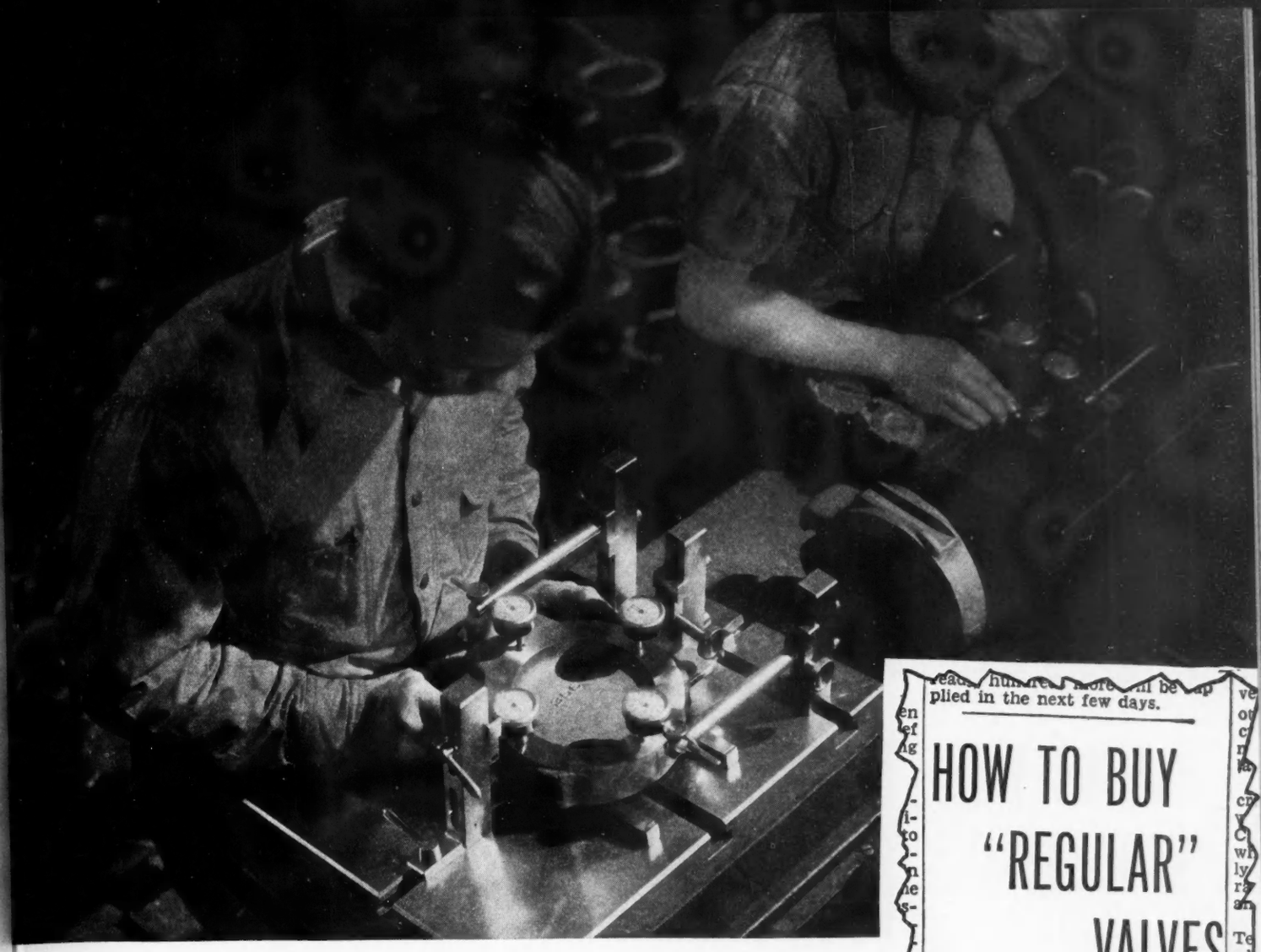


FIGURE 10. Shows the graph by means of which Formulas No. 11 and 12 can be used easily.



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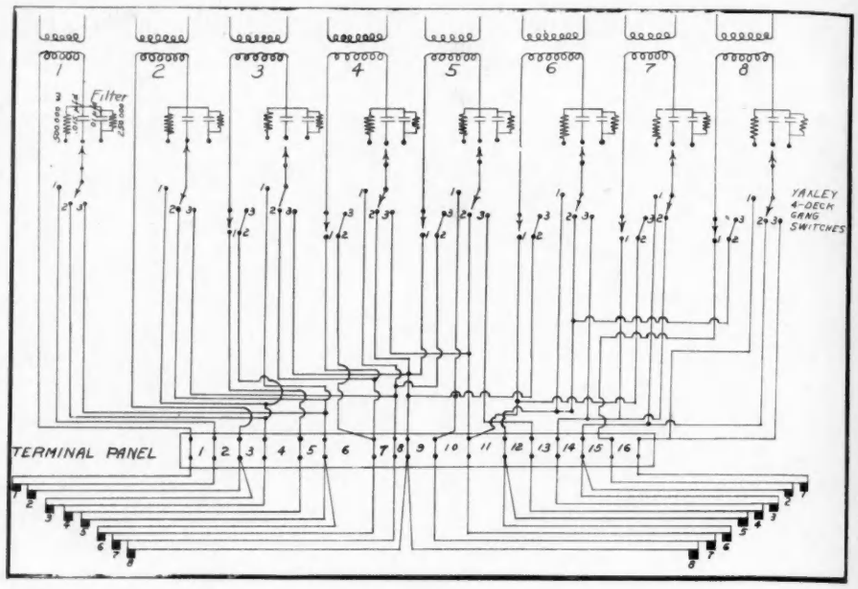

FIGURE 11. Wiring diagram of overlap arrangement for compounding 16 geophones strung in a straight line with the shot point.

zone gives the elevation correction expressed in time of travel.

Ground Roll

At this point of the present study it might be of interest to consider a very disturbing phenomena which oftentimes blurs the seismograph records to the point of worthlessness, and such records are labelled N. R. in the vernacular of the oil seismologist, presumably meaning "no reflection" or "no record."

This phenomena was the first stumbling block in the application of reflection seismology to the search of oil field structures and remedial measures of varying kinds were applied. It was first noticed that the ground roll possesses a characteristically low frequency of the order of 20 cycles per second whereas the reflected wave show frequencies of the order of 40 to 60 cycles per second. Thus the first improvement to the seismic equipment was the introduction of electric filter systems of the high-pass type with a cut-off frequency located in the neighborhood of 30 cycles. However it was found advisable to vary the cut-off frequency and adjustable high-pass wave filters were introduced. Some operators realized the necessity of obtaining records of the same characteristic frequency over a given area and band-pass wave filters are also used by different companies. This latest type of filter is adjustable as to the width and as to the cut-off frequencies of the bands thus providing very convenient adjustments by sliding the passing band of frequencies. By manipulation at each location the operator is in a position to obtain records showing reflections of similar character besides the elimination of ground roll.

Another remedy to ground roll interference is provided by its relatively low speed of propagation. By displacement of the geophone spread farther away or closer to the shot point, a location may be found where the ground roll disturbance will either have passed and died out before the arrival of the deep reflections or will arrive after the reflections are recorded.

Another way to fight ground roll is by using deeper shot holes. If the shot hole depth is smaller than the weathering thickness, the surface formations are liable to be induced into oscillations which is nothing more than ground roll. Thus deepening is the remedy.

Still, certain territories do not lend themselves to any of the above remedial measures and during the last few years compounding of large numbers of geophones has been used successfully by some companies. Figure 11 shows the wiring diagram of the overlap arrangement for the compounding of 16 geophones strung in a straight line with the shot point. The geophones are separated into 6 groups, 2 groups of 2 and 4 groups of 3 geophones. In each group, common leads are used for two adjacent pick-ups permitting a large saving in lines which include two three-conductor cables for the outside geophone groups of two- and four-conductor cables for the inner geophone group of three. All leads are connected to the panel terminal of the recording truck wherefrom they are linked by means of an intricate system of connections through a four deck gang of switches, a filter and an input transformer to the 8 amplifiers and recording oscillographs. Three positions are possible by means of the gang switches: A, B and C. The series grouping of the geophones is indicated by Table 4.

TABLE 4

Oscillograph	1	2	3	4	5	6	7	8
Position A	1	3	5	7	9	11	14	16
Position B	1	3	4	6	8	10	12	14
	2	4	5	7	9	11	13	15
	3	5	6	8	10	12	14	16
Position C	1	3	4	6	8	9	11	12
	2	4	5	7	9	10	12	13
	3	5	6	8	10	11	13	14
	4	6	7	9	11	12	14	15
	5	7	8	10	12	13	15	16

In actual field operation the observer tries successively the different available series combinations together with the possible adjustment of the rudimentary filter system which is incorporated in the lines. Suitable adjustments are often possible which will eliminate a large amount of the ground roll especially if the separation between geophones is such that the ground roll impulses will arrive at each succeeding geophone 180° out of phase and will compensate each other.

Correlation of Seismic Records

Since seismic records are similar to well logs, the correlation procedure is much the same and consists in recognizing reflection impulses coming from the same bed and besides in recognizing corresponding events on these impulses. This is not an easy matter and often enough the interpreter must appeal to his knowledge of the regional geology in order to decide upon the most probable interpretation. His decision is mostly guided

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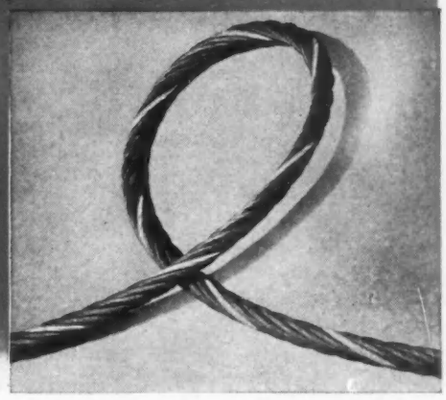

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by the knowledge of the following geologic features under the prospected territory:

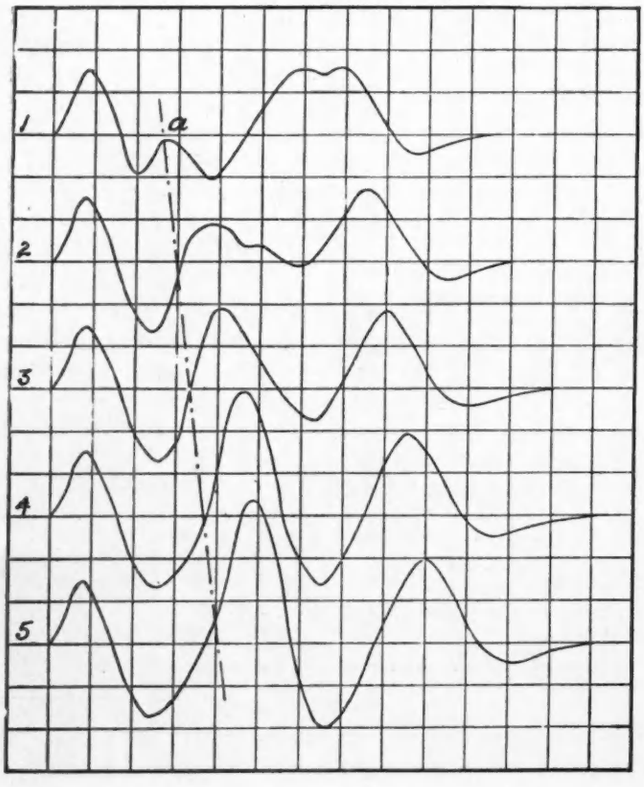
1. Regional Dip.
2. Direction of bed convergence.
3. Degree of bed convergence.
4. Subsurface geologic trends.
5. Possible presence of tectonic accidents such as faults, steep subsurface dips, etc.

In order to obtain a clear vision of the effect of convergence an isopachous map is often made.

One of the most difficult geologic phenomena to infer from seismic reflection records is the presence of a fault which may, in rare cases, be obtained by the evidence of steep subsurface dips. Oftentimes the records are blurred in the immediate vicinity of the fault due to the absence of a good reflecting horizon on account of its shattering or which is merely absent due to the downthrow on a surface of faulting.

One of the main difficulties encountered in correlating seismic records is caused by the so-called "leg-change" or "phase change" which is interpreted as the evidence of the arrival of a new burst of reflected energy and may be due to different possibilities, among others reflection from a lenticular bed not present underneath the entire area or from a surface of faulting. In the opinion of the writer, it is most commonly due to the interference of reflected waves from closely associated beds whose respective separation may vary within narrow limits but sufficiently large to produce a variation of the general appearance of the reflection. In Figure 12 are represented five theoretical curves, calculated for a successively increasing separation between the Hunton and Viola limestones as they are encountered in the Mid-Continent. Curve 1 shows a distinct arrival of the Viola reflection in *a*, whereas in curve 3, 4 and 5 a distinction is hardly possible from a mere inspection of the oscillations. Between the last three curves it is possible to interchange the correlation without much effort of the mind especially if one considers that the onset of the Hunton reflection may be indistinct due to some preceding disturbance which has not died out.

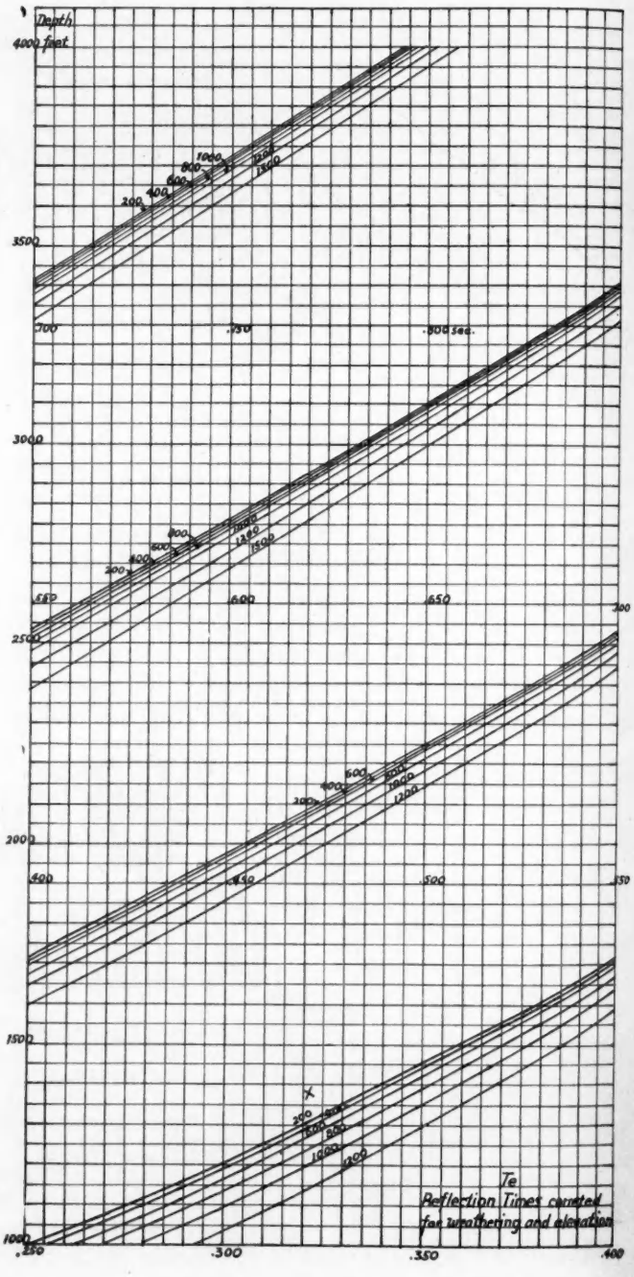
FIGURE 12. Five theoretical curves calculated for a successively increasing separation between the Hunton and Viola limestones as they are encountered in the Mid-Continent.

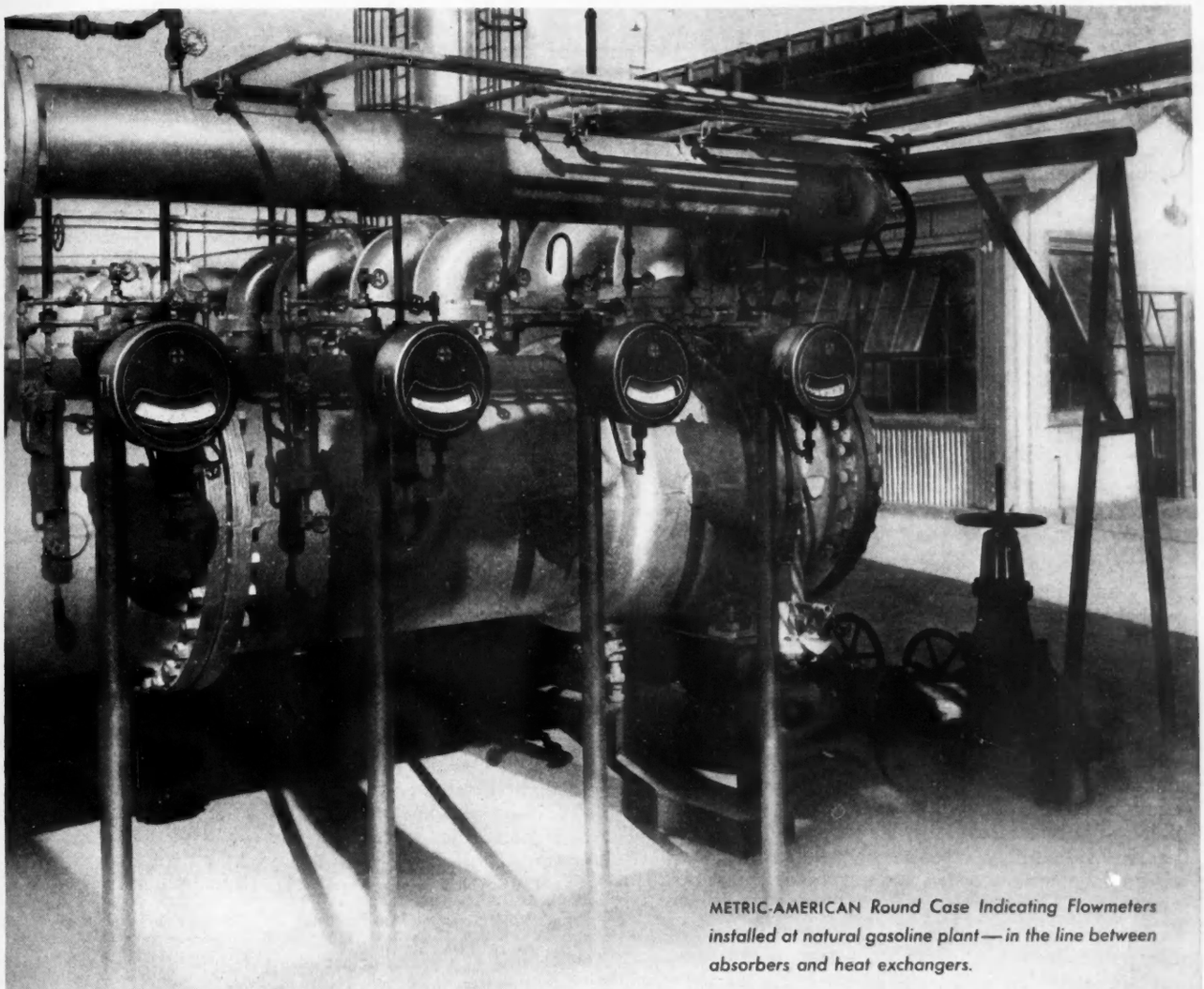


Depth Calculations

There are in general two ways of calculating depths according to the type of corrections which have been applied to the time measurements. If the weathering (t_w), elevation (t_e), angularity (t_s), and anisotropy (t_a)

FIGURE 13. Lines of Equation 2 drawn on this figure are diverging toward the origin of the chart. Such a depth chart is determined from well shooting velocity determinations and is consequently to be used only in the general vicinity of such a well.





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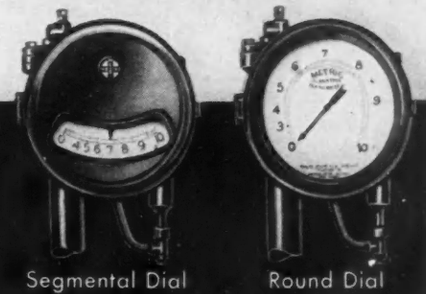

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corrections have been made in time units, they are merely subtracted from the reflection time measurements T and the results multiplied by the overall velocity V to the formation considered; the result gives twice the depth Z below the chosen datum or reference plane according to the following relation:

$$Z = \tfrac{1}{2}\ (T - t_w - t_e - t_s - t_a)V \qquad (13)$$

It is convenient to calculate the probable error in depth determination from formula (13) for which we can set, as an example, Table 5 of values representative of an average case in Oklahoma in the determination of the depth to the Viola limestone.

TABLE 5

T= 1.200 sec.	Error	.002 sec.
t_w= .025 sec.	Error	.003 sec.
t_e= .010 sec.	Error	.002 sec.
t_s= .005 sec.	Error	.001 sec.
t_a= .002 sec.	Error	.001 sec.
V=11.000 feet/sec.	Error	75 feet/sec.

By applying the theory of error to this case the most probable error in depth prediction is found to be 43.7 feet. It appears from the calculations that about three-fourths of the error is due to the error made in the velocity assumption which here has been conservatively estimated at .68 feet per hundred and it is the opinion of the writer that when extrapolating from a well in which velocity determinations have been made toward unknown territory, larger errors yet are made. True enough if the seismograph is used as a means of interpolation between known wells in which the stratigraphy has been definitely ascertained, a larger degree of precision is often recorded by means of velocity adjustment.

The second method of depth calculation is similar to the preceding, the difference being in the weathering correction which is made by correcting to the surface of the ground instead of to the weathering base. An excess time or delay in the weathered zone is subtracted. It is obtained from the following expression:

$$t_w = t_o \sqrt{\frac{V_2 - V_1}{V_2 + V_1}} \qquad (14)$$

in which t_w represents the delay.

t_o is the intercept on the ordinate of the travel-time curve plotted from data obtained by weathering shot.
V_1 is the average velocity in the weathered zone.
V_2 is the average velocity underneath the weathered zone.

A correction is further made for the depth of the shot hole, which is positive and obtained by dividing the shot hole depth by V_2.

Measurements are further reduced to a common datum by means of an elevation correction which may be positive or negative according to the mean elevation of the ground surface with respect to the datum. Their difference divided by V_2 gives the elevation correction.

The angularity correction is determined by means of a depth chart which provides at the same time the depth calculation. This chart is represented in Figure 13 and the depth (z) is plotted in ordinate as a function of the reflection time (T_e) corrected for weathering and elevation. Another variable enters the graph; it is the distance (X) from the shot point to the geophone considered. Equation 2 represents the lines drawn on Figure 13; they are diverging toward the origin of the graph. Such a depth chart is determined from well shooting velocity determinations and is consequently to be used only in the general vicinity of such a well. The velocity-depth chart used for the calculation of chart Figure 13 is given in Figure 14.

1. B. B. Weatherby and L. Y. Faust. Influence of Geological Factors on Longitudinal Seismic Waves, Bull. of Am. Assoc. of Pet. Geol., Vol. 19, No. 1, pp. 1-8, January, 1935

2. E. McDermott. Application of Seismography to Geological Problems, Bull. of Am. Assoc. of Pet. Geol., Vol. 15, No. 11, pp. 1311-1334, November, 1931.

3. I. Roman. Least Squares in Practical Geophysics, AIME Geophysical Prospecting, Vol. 2, pp. 460-506, 1932.

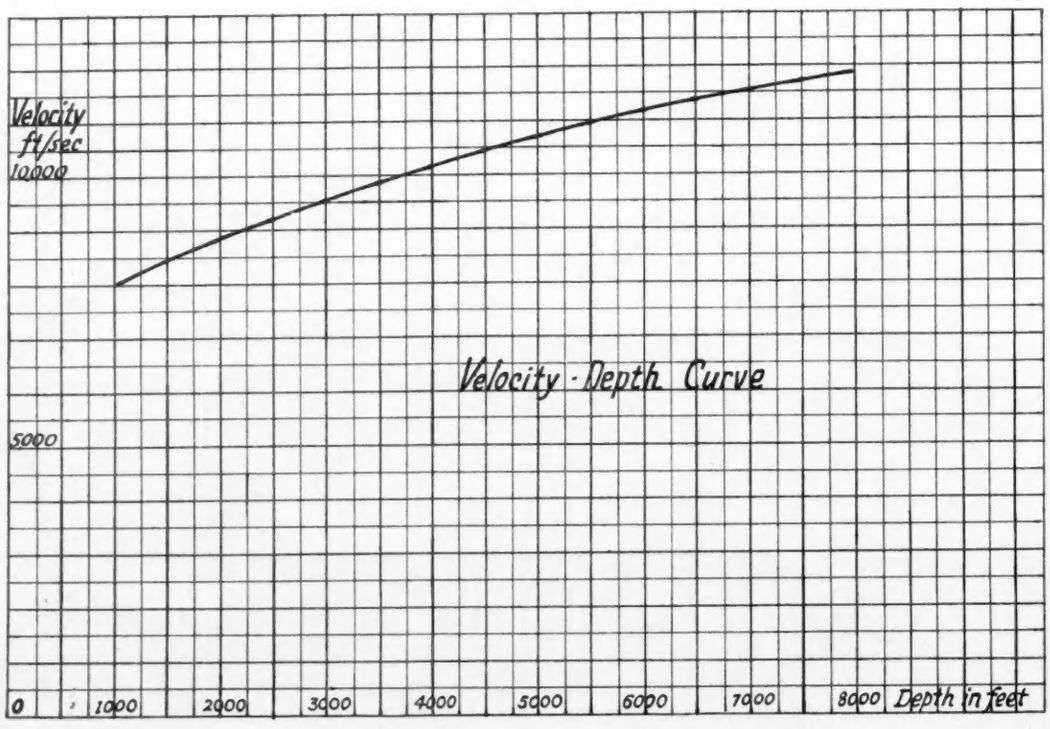


FIGURE 14. The velocity depth chart used for the calculation of the chart of Figure 13.

MEN IN THE INDUSTRY'S NEWS

W. N. DAVIS, formerly vice-president of Phillips Petroleum Company, Tulsa, recently resigned on account of ill health. He had been active in the American Petroleum Institute, the Independent Petroleum Association of America, the Mid-Continent Oil & Gas Association, and other industrial enterprises.

ORION A. DANIEL, geologist, has resigned from King Oil Company of Wichita Falls, Texas, and is doing consulting work in Centralia, Illinois.

F. E. MELOTT, geologist for Continental Oil Company, Wichita Falls, Texas, has been transferred to Centralia, Illinois.

ROBERT HAMILTON CUYLER, professor at the University of Texas, has returned to his duties at Austin after spending the summer working geological information on the Agua Dulce-Stratton district of Nueces County, for the John Camp Production Company of San Antonio.

J. W. PAULSEN, JR., has resigned as a member of the land and geological department of Signal Oil & Gas Company of California to become chief geologist for Petroleum Securities Company with headquarters in Los Angeles.

E. B. DUBSAMEN, of Trinity Drillers, Inc., San Antonio, really has a smile on his face—reason, two strikes out of two wells for two different companies on two separate prospects in Victoria County in a single week. Contract jobs for Union Oil Cmpany of California and Transwestern Oil Company opened new sands in the Keeran and McFaddin fields.

J. ARTHUR LUNDELL, of Lundell Producing Company, San Antonio, and discoverer of the Lundell field in Duval County, is in Wisconsin.

F. J. ADAMS, general agent for Gulf Oil Corporation, Fort Worth, Texas, recently visited Houston.

DICK O'NIEL, scout for Shell Petroleum Corporation at Midland, Texas, is spending his vacation in Houston.

FRANK MARSHALL, geologist for Snowden & McSweeney, Incorporated Wichita, Kansas, has moved to Bridgeport, Illinois, where he will head the office of that company.

BARNEY TERRELL, scout for Stanolind Oil & Gas Company, is visiting in New Orleans, La.

EVERETT BRADY, farm foreman for Amerada Petroleum Company in the Seminole district of Oklahoma, recently was injured when he fell off a derrick floor, breaking an arm and a leg.

J. BARNEY WHISENANT, of W. T. & D. Company, of San Antonio, has taken an apartment at Mattoon, Illinois. The company is interested in the development in that field.

A. E. BRADSHAW, president of the National Bank of Tulsa, has been elected to the University of Tulsa board of trustees. He will work with: John Rogers, attorney and vice chairman; C. H. Lieb, president, Carter Oil Company; Nelson K. Moody, president Sinclair Prairie Oil Marketing Company; J. C. Denton, counsel, Mid-Continent Petroleum Corporation; J. H. Gardner, president Gardner Petroleum Company; Fred L. Dunn, executive vice president First National Bank and Trust Company; Johnson D. Hill, president Atlas Life Insurance Company; Ralph O. Dietler, vice president Stanolind Crude Oil Purchasing Company; Dr. C. W. Kerr, pastor, First Presbyterian Church, and Doctor C. I. Pontius.

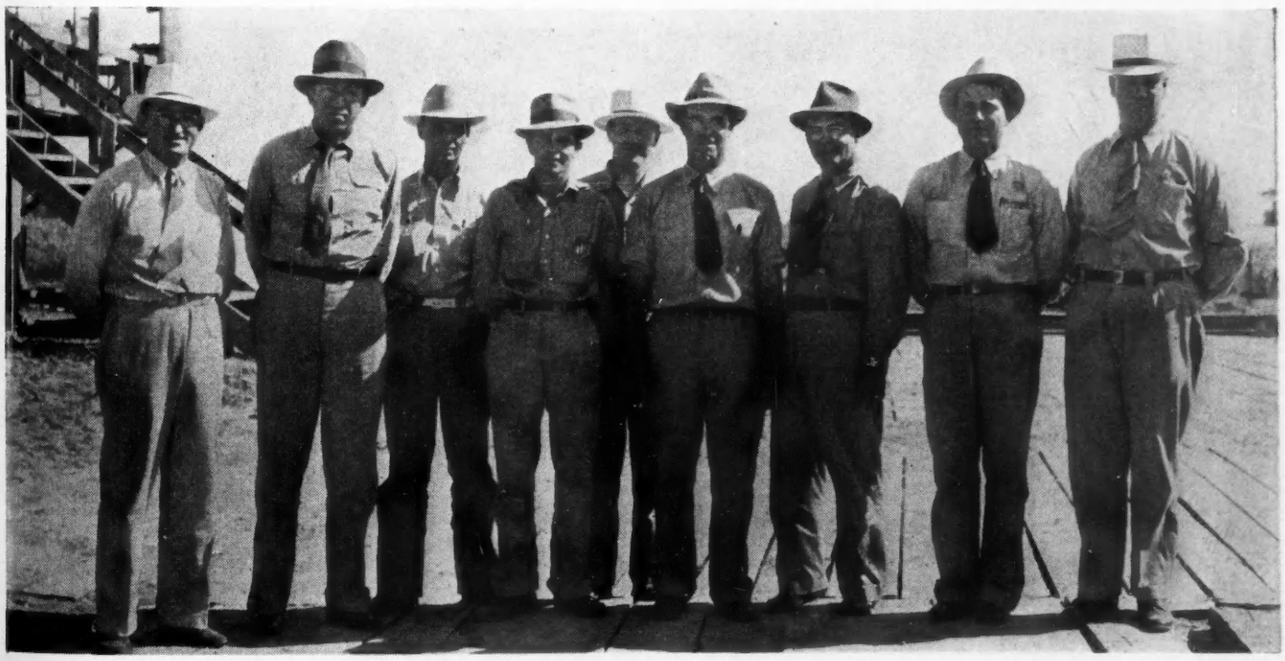
LOUIS TITUS, president of Conservative Oil Company of Corpus Christi and San Antonio, has been in the Illinois field, looking over the situation.

WALTER NELSON, San Antonio, is a Mattoon, Illinois, resident as a result of the new oil development.

See Important Discovery Well Completed

When Continental Oil Company completed F. Tate 1, regarded as the most important Louisiana Gulf Coast discovery in years, officials of the firm came from Texas, Oklahoma and Louisiana to witness the operation. Not only did the test open a new Evangeline Parish field, but found an entirely new producing horizon for the district. It will revive drilling in many of the older fields.

Reading from left to right are: George Meier, rig builder; J. G. Dyer, manager of drilling and production, Ponca City, Oklahoma; E. A. Butler, tool pusher for Nichols Drilling Company; C. L. Fisher, district superintendent in South Louisiana; Max A. Bornhauser, district geologist; E. O. Bennett, chief petroleum engineer, Ponca City; A. C. Wilkerson, assistant superintendent of pipe lines, Ponca City; F. B. Haverfield, superintendent of natural gas plants in Louisiana; T. R. Batte, Jr., general superintendent of Gulf Coast Division, Houston. All are with Continental Oil Company unless specified differently.



PAUL HENSHAW, of Henshaw Brothers, San Antonio, is in charge of a well being drilled under contract for H. H. Weinert, Inc., of Seguin, Texas. The well is located in Jasper County, Illinois, and is scheduled to 3500 feet, the deepest projected in the Illinois Basin proper. It will test the Niagaran lime, which produced at Sioso, Indiana, and Martinsville, Illinois.

G. A. STEELE, president of Pierce Oil Corporation of Mexico, has returned to headquarters in Mexico City after a trip to New York.

FRANK R. HARRISON, of the executive department of Gulf Oil Corporation at Houston, is spending two weeks in Mexico City and Tampico.

GRADY KIRBY and **JACK CHEVIGNY** are representing H. H. Weinert, Inc., in Illinois, Indiana and Kentucky. They maintain offices at Mattoon, Illinois. They are from San Antonio and Austin, Texas, respectively.

S. M. BENAVIDES has been placed in charge of the newly created Rio Grande Valley office of the Texas Railroad Commission. The new office is at McAllen and serves nine oil and gas fields in that area.

S. T. BERTRAND and Mittie Thomas have formed the B & T Petroleum Company of San Antonio. The concern is operating in the Branyon field of Caldwell County. L. P. Erfurth is secretary.

R. CLIFF BOWLES, chief geologist for Standard Oil Company of Kansas, has been in the North Sweden field, Duval County, looking over the company's operations. This concern is drilling more wells in the field and has completed more producers than any other operator.

C. E. BUCHNER, of Tulsa, executive secretary of the Independent Petroleum Association of America, has been in Houston to discuss with George A. Hill, Jr., of Houston, preparations for the association's annual meeting to be held in Houston October 14 to 16.

C. B. ECHOLS, chief clerk, purchasing department of Mexican Sinclair Petroleum Corporation at Tampico, is spending a vacation in Mexico City.

LEAVITT CORNING, JR., is back in San Antonio after an extended vacation on the West Coast.

PAT M. ARMSTRONG, Luling contractor, was a Houston visitor last week.

EARL BAKER, president of Baker Oil Company, San Antonio, was a recent visitor in Houston, Texas. Baker has a shallow production field 17 miles south of San Antonio on acreage owned in fee.

Find First Oil in Newton County, Texas

This drilling crew found the Cockfield formation saturation in Houston Oil Company and Republic Production Company's Pevey Moore Lumber Company 1, Call Area, and may open the first producing field in Newton County, Texas, Gulf Coast. The crew together with officials and visitors are, from left to right: John Duke, driller; E. Allen, field superintendent, Houston Oil Company; B. N. Flowers, helper; John Hoffpauir, derrick man; Don Mathes, geologist for Republic Production Company; R. J. Comeau, scout for Gulf Oil Corporation; T. J. Hardy, truck driver; and H. Allen, helper.

ANDRE H. MENUET has been appointed research engineer and technical advisor to W. T. Atkins, vice president in charge of sales of Skelly Oil Company, Tulsa. Menuet, formerly chief clerk of the Natural gasoline division, has moved his office to Kansas City, Missouri.

BERNARD H. LASKY, engineer and geologist, Houston, recently returned from a vacation with his family in Colorado.

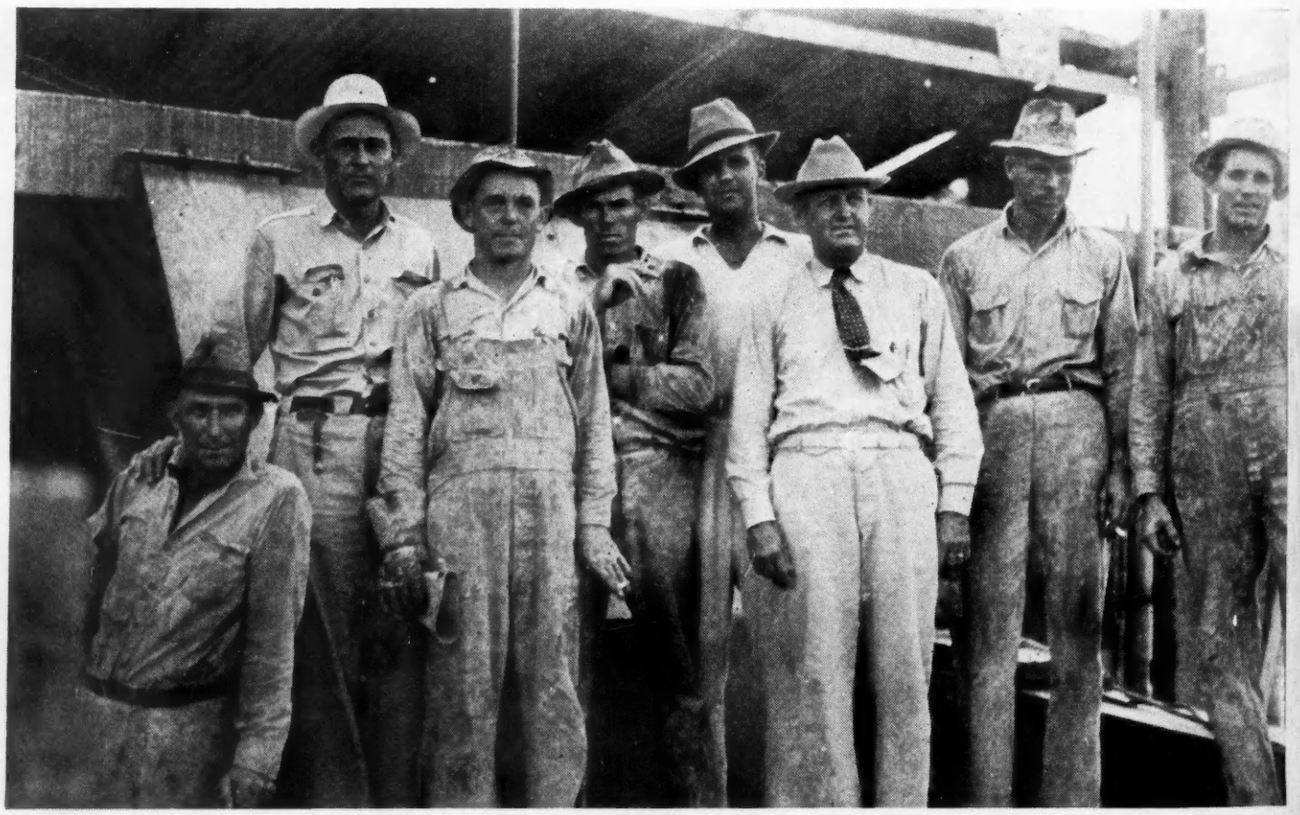
KNUD BRUUN, vice president of Turbolite Company, Houston, is enjoying a visit from his father of Denmark, who arrived at Houston by airplane on September 14. Bruun's father is a retired Danish banker.

DIED:

JOSEPH A. DEPEW, 57, claim adjuster for Sinclair-Prairie Oil Company, Tulsa, died September 8 after a long illness.

MARSHALL A. "MOLLIE" MALONE, accountant with Huasteca Petroleum Company at Tampico, Mexico, died September 12 from heart failure. He was a native of Louisiana, and had resided in Mexico for the past 15 years, having been employed by Compania Transcontinental de Petroleo and Compania Petrolera del Agwi, S. A., before joining the Huasteca. Malone was 43 years of age, and is survived by his wife and one son. Interment was at Shreveport, Louisiana, September 17.

THOMAS H. KIRKSEY, 31, field worker for Richardson Petroleum Company at Corpus Christi, was fatally injured while working on a well in the Saxet field.



Holding Steady

LOWER CRUDE OUTPUT WHILE DEMAND HOLDS HIGH LEVEL

TWO weeks of declining crude production under the influence of lower allowables in September leaves the crude market firm, although it is conceded that production still is too high in all districts. Runs of crude to refineries have continued at the peak but refiners' stocks of gasoline fell from 67,048,000 to 66,456,000 barrels and gas and fuel oil stocks gained 1,223,000 barrels to be less than 2,000,000 barrels more than stocks of those commodities a year ago.

These conditions existing, both crude and refined markets had nothing of the spectacular during the week and observers were forced to a long range view to gather any pessimism. Gasoline markets were quiet and unchanged, the volume moving on contract, and there is a probability that distributors' stocks are below normal as many of them have had the idea that the volume of business has been too good to last. Cooler weather in the northern consuming districts has not instantly stopped motoring as many market observers are wont to expect at this season. Emerging from the depression has had an effect upon American habits that is lessening the let-down in motoring in winter, so that the volume for the coming months is hard to calculate.

Preparation for cold weather requiring lighter gasoline had a strengthening effect on natural gasoline. Stocks of this commodity are large in anticipation of this demand.

Active demand for furnace fuels began late last week after some observers had been concerned by the delay. Much of this material is contracted well ahead and competition with coal will prevent violent price fluctuations.

Mid-Continent Prices

Tank car prices at Mid-Continent refineries late last week were largely the same as for the preceding several weeks.

U. S. motor gasoline continued to range in the Oklahoma market about as follows: 62 octane and below, 5 to 5¼ cents a gallon; 63 to 67 octane, 5⅜ to 5¾ cents; and 68 to 70 octane, 6 to 6⅛ cents.

Corresponding prices in the Chicago market were: 4¾ to 5 cents, 5¼ to 5⅝ cents, and 5⅝ to 6 cents.

At East Texas refineries the most common product, 60-62, 400 end point gasoline, ranged from 5⅛ to 5¼ cents a gallon.

Kerosene prices f.o.b. Oklahoma refineries ranged from 4 to 4¼ cents a gallon for the 41-43 water white grade, and from 4¼ to 4⅜ cents for the 42-44 water white grade. Corresponding prices in the Chicago market were: 4 to 4¼ cents and 4 to 4⅜ cents.

Bureau reports show many oil records in July

CRUDE petroleum production in July reached 110,721,000 barrels, slightly less than 5,000,000 barrels above the June output of 105,812,000 barrels, and more than 18,000,000 barrels above the July, 1936, total of 92,0078,000 barrels, it was reported by the Bureau of Mines September 10.

Daily average production for the month, however, at 3,571,600 barrels while 44,500 barrels above the June average, was slightly under the record figure of 3,578,000 barrels recorded in May.

Most of the major producing districts of Texas recorded increases in July, but the daily average of 1,415,700 barrels for the state was about 15,000 barrels under the record average of May, the bureau said in commenting upon the month's activities. The increase in East Texas from 468,200 barrels daily in June to 473,700 barrels daily in July was seen as probably directly related to the gain in number of wells completed from 178 to 243.

The Oklahoma City field regained some of the ground lost in June, a 10,000 barrel rise in daily output matching the increase in the state's total.

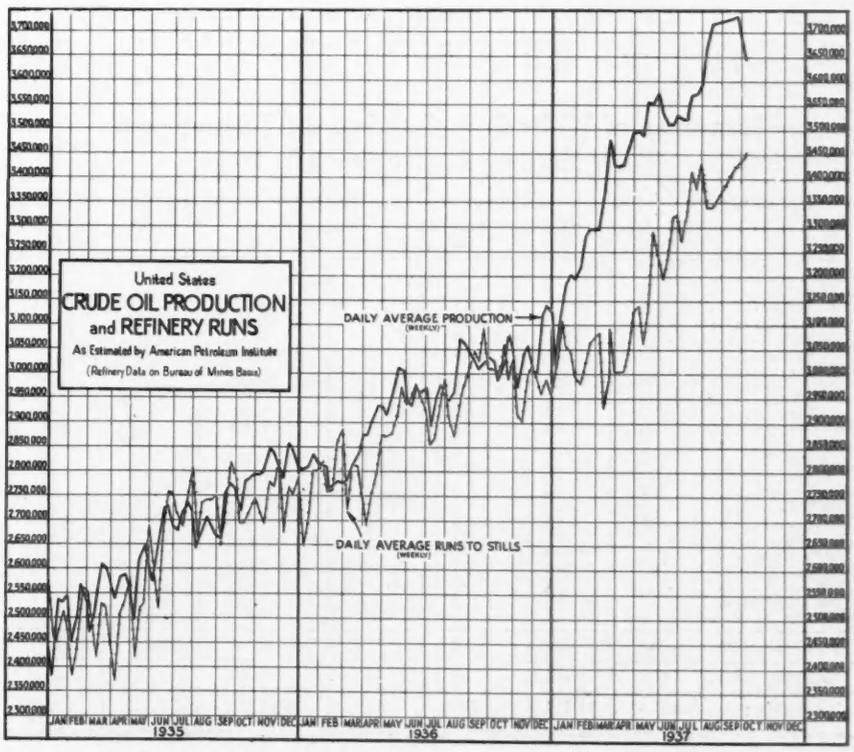
Production in California remained virtually unchanged at about 664,000 barrels daily. Louisiana's total production showed a small gain, but the daily average reached a new record at 257,000 barrels. Kansas also established a new high at an average of 207,300 barrels.

Output in Illinois continued upward as expected, and the state became the eleventh in rank among the producing states compared with fourteenth in June. Among the individual fields which have established themselves as of major importance are Talco, Texas, and Lisbon, La.

Gasoline Yield Down

The yield of gasoline continues to decline in favor of gas oil and distillates, the bureau reported, and the July average of 43.2 percent was three-tenths of one percent below that of June and 1.4 percent below that of July, 1936. In terms of crude oil requirements, it was pointed out, the reduction in the yield from a year ago represents just over 100,000 barrels daily.

"The indicated domestic demand for motor fuel in July was 50,929,000 barrels, or nine percent above that of a year ago," the report commented. "Although this marked the first time that the 50,000,000-barrel level has been exceeded, the total was about 1,500,000 barrels below expectations. Exports of motor fuel continued to exceed the estimates, although declin-


United States
CRUDE OIL PRODUCTION
and REFINERY RUNS
As Estimated by American Petroleum Institute
(Refinery Data on Bureau of Mines Basis)
DAILY AVERAGE PRODUCTION
(WEEKLY)
DAILY AVERAGE RUNS TO STILLS
(WEEKLY)
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1935
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1936
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1937

ing to 2,962,000 barrels in July from just over 3,000,000 barrels in June. The predicted decline in motor-fuel stocks of about 5,000,000 barrels almost materialized as far as gasoline was concerned, but was somewhat offset by a seasonal gain in natural gasoline stocks. Stocks of finished and unfinished gasoline on July 31 were 70,120,000 barrels, compared with 62,446,000 barrels a year ago."

Among the statistics of the other products of particular interest, the bureau pointed out were the increases of about 3,000,000 barrels in both light and heavy fuel oil stocks, however, it was said, the demand, particularly for the light grades, has been such as to keep days' supply considerably under a year ago.

Details of the month's production and demand were as follows:

New Supply; Domestic Production: Crude 110,721,000; daily average 3,572,000; natural gasoline 4,128,000; benzol 256,000; total production 115,105,000; daily average 3,713,000; imports: crude in bond 174,000; for domestic use 3,025,000; refined in bond 2,113,000; for domestic use 603,000. Total new supply of all oils 121,020,000; daily average 3,904,000. Increase in stocks, all oils, 2,739,000.

Demand; total 118,281,000; daily average 3,816,000. Exports: Crude 6,353,000; refined 9,556,000. Domestic demand: Motor fuel 50,929,000; kerosene 3,594,000; gas oil and distillate fuels 6,614,000; residual fuel oils 25,849,000; lubricants 1,931,000; wax 103,000; coke 482,000; asphalt 2,782,000; road oil 1,510,000; still gas 5,531,000; miscellaneous 198,000; losses 2,839,000. Total domestic demand 102,362,000; daily average 3,302,000.

Stocks: Crude 308,666,000; natural gasoline 6,918,000; refined products 237,840,000; total, all oils 553,424,000; days supply 145.

Crude runs to stills established another new record in July at 3,380,000 barrels daily, 69,000 barrels above the June average and 422,000 barrels, or 14 percent, above that of July, 1936.

Receipts of crude at refineries during the month totaled 104,461,000 barrels, of which 101,262,000 were domestic and 3,199,000 foreign, it was reported. Crude runs to stills totalled 104,783,000 barrels and fuel and losses were 304,000 barrels. Stocks declined slightly more than 600,000 barrels from 56,666,000 barrels July 1 to 56,040,000 barrels July 31.

CRUDE OIL PRICES

Complete tables of prices paid for crude oil at the well in principal fields is shown on page 56 of issue of September 6. Hereafter this schedule will appear only in the first issue of each month.

Trends of United States Production and Stocks

(Figures American Petroleum Institute, except Crude Stocks, Bureau of Mines)

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stocks (Barrels)
January 2, 1937	3,121,400	3,030,000	287,659,000	62,661,000	106,330,000
January 30	3,194,050	2,995,000	285,384,000	69,540,000	102,078,000
February 27	3,296,100	3,085,000	288,121,000	78,786,000	99,534,000
March 27	3,431,300	3,060,000	293,587,000	*83,538,000	96,591,000
April 24	3,496 400	3,125,000	300,737,000	82,303,000	94,100,000
May 29	3,573,000	3,245,000	306,445,000	78,758,000	96,139,000
June 26	3,529,600	3,235,000	307,679,000	75,427,000	100,395,000
July 31	3,591,900	3,425,000	308,250,000	70,872,000	108,209,000
August 7	3,651,150	3,340,000	307,922,000	69,216,000	108,597,000
August 14	3,718,600	3,340,000	308,737,000	69,087,000	109,664,000
August 21	3,729,350	3,415,000	309,699,000	67,260,000	110,493,000
August 28	*3,731,450	3,425,000	309,506,000	66,997,000	112,111,000
September 4	3,692,550	*3,445,000	310,417,000	67,048,000	113,443,000
September 11, 1937	3,642,400	3,445,000	.....	66,456,000	114,666,000
September 12, 1936	3,020,850	3,095,000	298,448,000	57,918,000	113,109,000

* All time peak.

Summary of Wells Completed in the United States Week Ending September 18, 1937

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1937	Total this Date 1936
Alabama	....	....	....	....	.....	1	2
Arkansas	2	1	....	1	5	83	73
California	21	19	....	2	20,165	1,080	771
Colorado	....	....	....	....	.....	10	10
Florida	....	....	....	....	.....	1	2
Illinois	10	9	....	1	3,612	146	4
Indiana	....	....	....	....	.....	90	147
Kansas	59	44	....	15	55,848	1,901	1,197
Kentucky	18	11	3	4	209	274	204
Louisiana	24	15	3	6	8,879	693	754
Michigan	30	20	....	10	7,887	685	561
Mississippi	....	....	....	....	.....	10	5
Montana	3	1	....	2	144	140	124
Nebraska	....	....	....	....	.....	....	.....
New Mexico	7	4	2	1	353	505	412
New York	4	....	3	1	.....	14	.....
Ohio	34	7	17	10	104	1,071	1,342
Oklahoma	31	23	1	7	8,735	2,232	2,114
Pennsylvania	12	2	6	4	60	147	.....
Texas	263	206	7	50	346,863	10,936	9,029
Utah	....	....	....	....	.....	....	.....
West Virginia	23	4	15	4	12	660	476
Wyoming	4	3	1	....	2,237	76	61
Total this week.	545	369	58	118	455,113	20,755	17,291
Total last week.	626	444	58	124	463,531	....	.....
Total this year.	20,755	14,414	1,733	4,608	17,307,031	....	.....

Natural gasoline stocks rise to all-time high

Natural gasoline production in July totaled 173,376,000 gallone compared with 162,498,000 gallons in June, the daily average output of 5,593,000 gallons being the highest recorded for any month since January, 1931, and 176,000 gallons above the June level, according to the monthly report of the Bureau of Mines, issued September 9.

Most notable increases in production in July, the bureau commented, were in the Oklahoma City, Panhandle and East Texas fields.

Although refinery consumption increased materially over June, it was stated, exports were considerably lower, and this decrease, combined with the gain in production, was reflected in stocks, which increased 27,762,000 gallons to a new high for the year of 290,556,000 gallons.

Stocks at refineries, it was reported, increased from 132,594,000 gallons June 30 to 141,204,000 gallons July 31, while stocks at plants and terminals increased from 130,200,000 to 149,352,000 gallons.

TOM BELL, California driller who has been working on a wildcat in Rhodesia, South Africa, has been confined in a hospital for three months as a result of an encounter with a leopard.

Comparison of Permits Granted for New Wells

STATE	Week Ending Sept. 18	Total this Mo.	Total this Year	Total this Date last Year	1936 Year Total
Arkansas	11	23	182	70	103
California	26	90	144	764	1,054
Louisiana	32	91	918	824	1,107
Kansas	48	177	2,008	1,285	1,873
Michigan	22	55	715	529	762
Oklahoma	40	129	2,089	2,081	2,594
Texas	206	883	12,985	10,990	15,582
Total	385	1,448	20,041	16,543	23,075

Again Going Up

INCREASE IN PRODUCTION IN ALL PRINCIPAL DISTRICTS

ALTHOUGH United States crude oil production rose slightly during the past week ended September 18, averaging 3,665,825 barrels daily, it was still more in line with market requirements than production in the month of August.

The increase of the daily production in the last week amounted to 35,800 barrels, which was 156,525 barrels a day more than the Bureau of Mines estimate of average daily output needed to satisfy the markets in September.

The somewhat higher production during the past week resulted from gains in Texas, Oklahoma, Kansas, California and New Mexico, which greatly exceeded slight decreases in Louisiana and Arkansas.

Texas Yield Up

Texas output was 7200 barrels a day higher than the week before, averaging 1,448,600 barrels daily, which was 75,000 barrels a day more than the federal government bureau's estimate of demand.

Oklahoma production was up 4675 barrels above the previous week's level, in averaging 609,175 barrels a day, and was 24,425 barrels daily under the Bureau of Mines recommendation.

Kansas last week averaged 195,475 barrels a day, 7075 more than in the previous week, and 5425 less than the indicated demand.

California Increases

California showed the biggest increase in production, averaging 694,000 barrels daily, which was 10,000 barrels a day more than in the previous week, and 55,800 barrels daily more than the estimated demand.

New Mexico production rose 100 barrels to 114,200 daily, which was 12,800 barrels a day more than the Bureau of Mines estimate.

Louisiana showed a small decline of 1650 barrels daily, averaging 257,825 barrels a day, or 9,925 barrels daily more than the estimated demand.

Michigan August output near all-time peak

Mount Pleasant, Mich. — Michigan produced 1,605,506 barrels of oil in August for a new 1937 high and second only to October, 1935, when 1,730,000 barrels was produced for an all-time Michigan mark. Michigan's total production this year now stands at 9,892,000 barrels.

Ten of the 14 producing districts in the state showed gains over July with the biggest increase recorded in Buckeye where production jumped from 535,034 barrels in July to 653,684 barrels last month.

Production by pools for the two months follows:

Field	August	July
Porter-Yost	339,952	285,641
Chippewa-Greendale	62,669	61,022
*Sherman (Isabella)	185,154	152,269
Vernon-Denver	61,847	55,027
Crystal	41,211	44,140
Edmore	3,264	2,094
Beaverton	9,281	12,016
*Buckeye	653,684	535,034
Ogemaw	84,675	69,756
*Clayton	125,895	112,382
Saginaw	3,955	3,965
Dundee-Monroe	881	673
*Allegan	27,235	23,399
Muskegon	5,803	7,152
TOTAL	1,605,506	1,364,564

*Fields developed this year.

United States Crude Oil Production

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Recommendation (Daily in Sept.)	ACTUAL PRODUCTION: BARRELS DAILY FOR WEEK ENDING	
		September 18	September 11
TEXAS—			
Texas Panhandle	.....	82,100	81,200
North Texas	.....	75,200	75,100
West Central Texas	.....	33,700	33,600
West Texas	.....	221,800	221,300
East Central Texas	.....	115,600	114,100
East Texas Field	.....	476,400	475,500
South Texas	.....	273,600	271,200
Texas Gulf Coast	.....	210,200	209,400
Total Texas	1,413,600	1,488,600	1,481,400
OKLAHOMA—			
Oklahoma City	.....	147,250	148,775
Seminole Area	.....	122,675	122,075
Crescent	.....	7,950	8,000
Lucien	.....	14,625	14,025
Fitts	.....	86,175	82,900
Edmund	.....	15,500	15,500
Moore	.....	9,800	9,725
Others	.....	205,200	203,500
Total Oklahoma	633,600	609,175	604,500
KANSAS—			
Ritz-Canton	.....	4,875	4,975
Chase	.....	8,350	6,875
Hollow-Nikkel	.....	2,600	2,675
Sedgwick	.....	3,750	3,725
Burrton	.....	14,000	14,175
Lorraine	.....	4,175	3,475
Russell County	.....	36,750	36,375
Silica	.....	18,900	17,200
Others	.....	102,075	98,925
Total Kansas	200,900	195,475	188,400
LOUISIANA—			
North Louisiana	.....	86,525	83,075
South Louisiana	.....	171,300	176,400
Total Louisiana	247,900	257,825	259,475
ARKANSAS	29,900	30,950	31,750
CALIFORNIA—			
Long Beach	.....	58,000	58,000
Santa Fe Springs	.....	42,500	43,000
Huntington Beach	.....	39,000	37,500
Dominguez	.....	30,500	30,000
Inglewood	.....	16,000	16,000
Ventura Avenue	.....	34,500	35,000
Seal Beach	.....	9,500	9,000
Midway-Sunset	.....	75,500	74,500
Elwood	.....	8,000	8,500
Kettleman Hills	.....	78,500	81,000
Mountain View	.....	19,000	17,500
Playa del Rey	.....	8,000	8,000
Wilmington	.....	61,500	56,000
Others	.....	213,500	210,000
Total California	638,200	694,000	684,000
MOUNTAIN STATES—			
Wyoming	55,900	59,800	56,300
Montana	18,200	18,100	17,800
Colorado	5,000	4,700	4,800
Total Rocky Mountain States	79,100	82,600	78,900
NEW MEXICO	101,400	114,200	114,100
EASTERN STATES	124,300	142,100	138,900
MICHIGAN	40,400	50,900	48,600
Total United States	3,509,300	3,665,825	3,630,025

IN THE

Financial Field

Oil company stocks are carried downward in general decline of the markets for securities.

* * *

Forecast indicates that oil companies will continue to show favorable profits in 1938.

OIL COMPANY securities have continued to drift downward with the general current of the market, failing to show the exceptional strength that they manifested in some recent weeks.

Along with the stocks representing numerous other industries, some of the oil shares last week were back down around the lowest levels of this year.

Until a few weeks ago, the oil shares were not always sympathetic with the general trend of the market, displaying greater than average strength.

The less favorable showing lately apparently has been due in part to some liquidation carried out under the theory that the industry now is passing the peak of its business for the year, and that the results henceforth will not be as attractive as those of the earlier months this year.

Nevertheless, recent declines in the prices of oil company stocks possibly have been due largely to the general lack of confidence over the prospects for all industry and commerce. The market as a whole, of course, has been influenced to some extent also by the wars and threats of war in Europe and the Far East.

Oil Company Dividends

Dividends by oil companies this year show improvement commensurate with the gains that have occurred in oil company earnings. For the third quarter of this year, cash dividend payments by the companies of the Standard Oil group are estimated by Carl H. Pforzheimer, of New York, at $31,978,898, compared with $29,911,506 in the third quarter of 1936. The total cash disbursements of the group for the first three quarters of this year will total approximately $152,413,136, compared with $124,600,645 in the first nine months of last year, an increase of 22 percent. The company stated that current indications are the distributions for this group this year will compare favorably with the peak of $286,526,728 paid out by the group in 1930.

In the same report it was stated that 23 oil companies for the first six months of this year showed earnings about 50 percent higher than those in the similar period last year. It was stated, furthermore, that the group of 23 companies was fairly representative of the industry as a whole, and that the 50 percent increase in earnings, consequently, was fairly typical of the industry.

Expect Good Earnings in 1938

Another interesting report that lately has become available is that of the Standard Statistics Company, New York City, presenting a current survey of the petroleum industry. In that report, it is stated that the industry has continued in a sound statistical position largely because of favorable volume of demand, and that the earnings for the industry in 1937 consequently are likely to be among the best ever reported. The 1937 earnings promise, it was stated, to be near to or above those of 1929, the previous best year on record. It was stated, furthermore, that there is not at present any evidence that the upward trend of earnings will be halted in 1938, although the rate of increase probably will slacken, while there is always a possibility of unexpected adverse developments in the industry.

The Standard Statistics Company report stated that the outlook for the remainder of 1937 rests chiefly on the control of crude oil and gasoline production and on the effect of weather on fuel oil and gasoline demand. The stricter allowables of September, it was pointed out, represent a favorable circumstance.

Illinois Production Watched

One uncertainty that exists in the crude control situation, it was stated, is the possibility of substantial overproducion from states where effective proration has not been adopted. The new development in Illinois was pointed out as being representative of this type of uncertainty, since Illinois does not have an established proration program. It is conceded, however, that Illinois perhaps could develop effective proration, if necessary, before pipe lines and other physical facilities could be provided for taking care of any quantity of crude production that would be of market-breaking proportions.

A circumstance that is pointed out as likely to prevent more than temporary over-production is the prevailing large consumption of petroleum. To fulfill the demand, it was stated, the industry must regularly find the equivalent of two major oil fields a month. Such fields are not being found this year, and so long as the discovery rate remains comparatively low, the industry is likely to continue to have favorable markets and earnings.

Third Quarter Profits Large

The Standard Statistics Company report estimated that the third quarter earnings of most oil companies this year will be close to the largest for any three months on record, if not actually the largest. The report estimated that the total 1937 earnings will be between 40 and 50 percent above those of 1936, or approximately the same as for 1929, the peak year for oil company profits in general.

The oil industry has in prospect a new record volume of consumption for next year, according to the report, and barring unforeseen developments, the industry faces 1938 with the prospect of additional increases in earnings and dividends. It appears improbable, however, that the year-to-year gain for 1938 will be as large as that in prospect this year.

Navarro To Pay Dividend

Navarro Oil Company, of Houston, Texas, has declared a dividend of 10 cents a share, payable September 30, to stockholders of record September 20.

The Mission Corporation is expected to pay another dividend at the end of this year, in order to avoid the penalty imposed under the present federal taxes on undistributed profits. This prospect looms in view of the dividends received by the Mission Corporation this year on its holdings in Skelly Oil Company and Tide Water Associated Oil Company, and in view of the possibility that additional dividends will be received from those companies later this year. The Pacific Western Oil Corporation, owner of about 46 percent of the outstanding stock of Mission Corporation, will be the chief beneficiary of any additional dividends by the Mission Corporation this year.

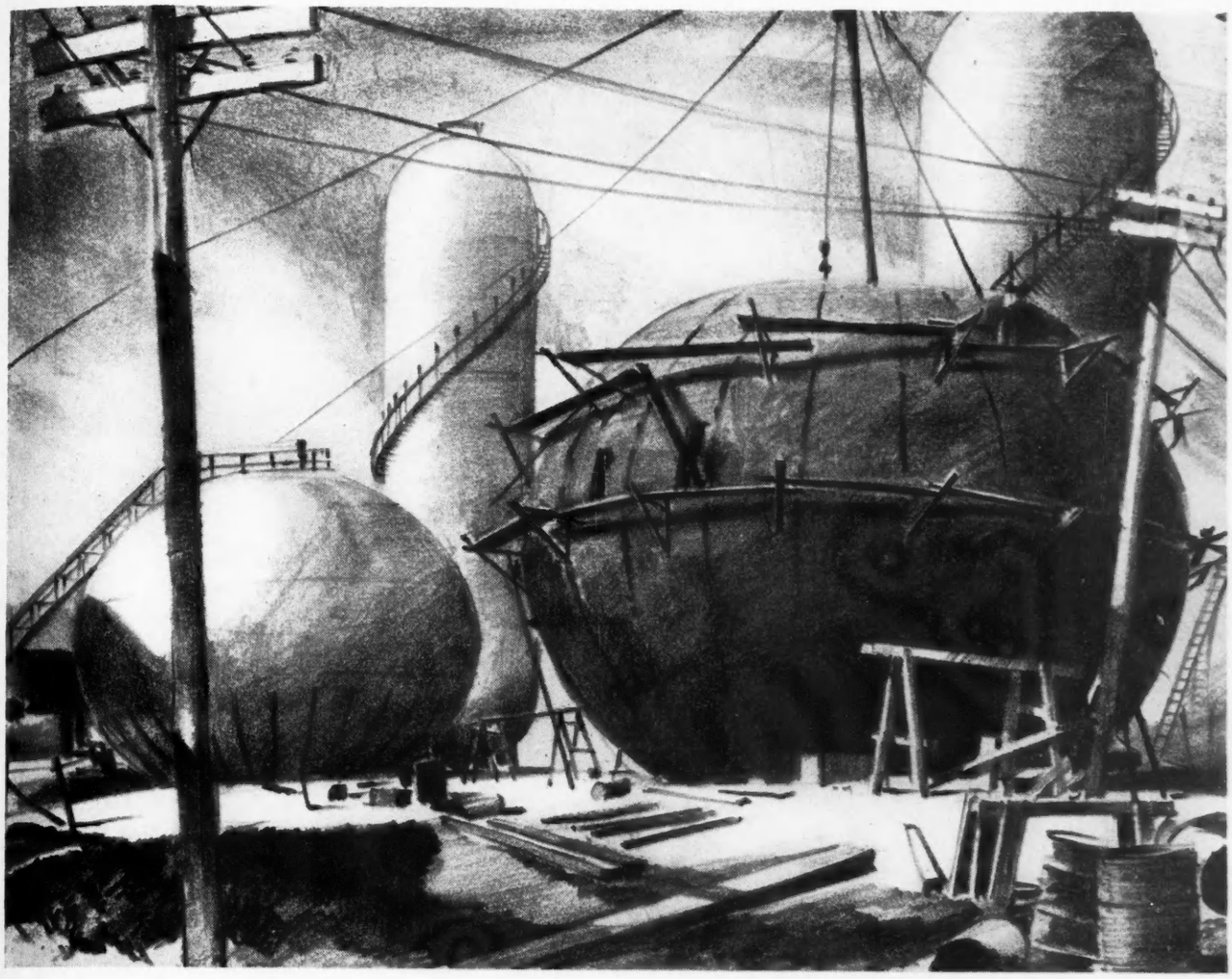
Continental Oil Company is showing for the third quarter of this year about the same profits as in the previous quarter. The company is expected to show for all of 1937 a new peak of earnings. The profits for 1936 were the greatest on record for the company, so far.

In an amendment filed with the Securities and Exchange Commission, the record date for stockholders to subscribe to the offering of 218,008 shares of American Republics Corporation capital stock has been changed to September 10, instead of August 20.

For the 12 months ended July 31, 1937, Oklahoma Natural Gas Company reported a net income of $1,393,540, after usual deductions; compared with $862,951 in the preceding 12 months.

Colonial Beacon Oil Company, controlled by Standard Oil Company of New Jersey, has reported for the first half of 1937, a net loss of $872,136, after usual deductions, compared with a net loss of $1,352,856 in the similar period last year. For the quarter ended June 30, this year, the company showed a net loss of $322,172, compared with a net loss of $549,964 in the preceding quarter and with a net loss of $1,013,280 in the June quarter of 1936.

Creole Petroleum Corporation this year is experiencing improved earnings because of larger crude oil production and better prices. In 1936 the company earned $8,596,448, after usual deductions, or 56 percent more than the profit of $5,509,067 in 1935. The company this year has paid higher dividends, in line with the improvement it has shown in earnings.



PRESSURE TANKS

From a lithograph by E. M. Schiwetz

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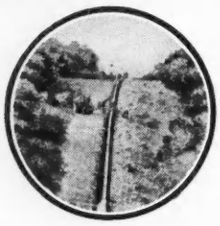
PIPE LINE NEWS



Delay start of proposed West Texas lines.

* * *

Lisbon field is without a pipe line outlet.

CURRENT heavy rates of production appear to be taxing pipe line capacities to the point that it is influencing the construction of additional systems. Last week several proposed lines to new areas in the northern part of the Permian Basin in West Texas were being held in abeyance. No announcement for delaying the construction has been made. Meanwhile, pipe line capacities in several other West Texas areas were so heavily taxed that owners were resorting to pipe line proration.

It also was made known last week that Gulf Refining Company would discontinue buying in the new Lisbon, Louisiana, field. This action leaves the pool with an outlet.

Delay West Texas Lines

There arose uncertainty last week as to what is to be done immediately regarding new pipe lines for recently opened fields in West Texas. Humble Pipe Line Company officials at midweek gave confirmation that the company had temporarily suspended work on its proposed pipe line, which was to extend northeasterly from Hobbs, New Mexico, to the new Wasson field, Gaines and Yoakum counties, West Texas, a distance of about 26 miles, and thence to the new Bennett field, another 12 miles. It was reported the company already had pipe for the line on hand at Hobbs, and that it was preparing to award contract for construction of the line, when action on the project was halted.

Since the Humble company did not reveal reasons for suspension of work on the line, it was speculated that the action may have been based on the move recently made by Continental Oil Company toward construction of a pipe line over practically the same route, from Hobbs field to Wasson to Bennett. The plans of that company were said to be only tentative, and the company late in the week had not yet started any line-building work. But the company had made a preliminary survey for a 6-inch welded line, proposing to deliver oil from the Bennett and Wasson fields to a major pipe line system or a loading rack at Hobbs.

While it appeared that one of the proposed pipe lines might be abandoned in deference to the other, it was conceded as quite possible that both might be built, in competition with each other. The Wasson field has offered encouragement for important line building, having indicated that it will develop into a good field.

It has been rumored that Texas-New Mexico Pipe Line Company contemplates building a line from Hobbs northeasterly into Yoakum, Cochran, and Hockley counties, but such a project apparently has not yet moved far toward actual execution.

Also still in an indefinite status is the proposed new pipe line of Gulf Oil Corporation from the Sand Hills area, western Crane County, to a point 11 miles north of the company's Crane Station, Upton County, a distance of about 27 miles. That line presumably was planned for handling crude from the company's Sand Hills deep wells, that produce from the Ordovician. It is supposed that the proposed pipe line construction has been held in abeyance because of disappointing showings made recently by several wells drilled to the deep pay zone.

Line From Gato Ridge

Petrol Corporation of California has completed plans for building a 23-mile pipe line from Gato Ridge field to Port Petrol, 3 miles south of Point Sal on the Pacific Ocean. The line will be 8-inch with a maximum capacity of 25,000 barrels, and only two pump stations will be required. Total storage of 250,000 barrels will be built at the terminal, and the oil will be moved in tankers. It is expected contract will be let in about two months.

Petrol Corporation has a potential of 6000 barrels a day from Gato Ridge, and the corporation controls about 2700 proven acres in the field. During August, 85,000 barrels of oil was moved. Petrol's wells are choked back in keeping with allowable figures.

Lisbon Without Outlet

Thirty Lisbon operators at a meeting in Shreveport, September 16, deferred action on steps toward securing another market outlet for their production until next Tuesday, pending word from M. J. Grogan, head of Caddo Pipe Line Corporation, which has planned another line to the field to be completed by October 15.

Gulf Refining Company, which has the only line to Lisbon has announced it will cease buying crude there October 1.

An official of the Grogan company told the operators that Grogan can handle only 7000 barrels daily at the posted price of $1.10. The Lisbon oil, described as "sour crude", will be mixed with Cotton Valley high gravity distillate by the Grogan refinery, the operators were told.

Grogan's representative said three buyers had indicated willingness to purchase the remaining production in the field at 8 cents under the posted price.

Before Lisbon's production can be sold ratably, however, the Gulf gathering system will have to be purchased or new gathering systems installed.

It was explained that Grogan-Caddo had contracted for 7000 barrels a day from one of four laterals in the field. The three remaining laterals will be without gathering lines when the Gulf halts its operations.

Plan Burnips Outlet

The Michigan public utilities commission on November 9 will hold a hearing on an application of Gerrit Vander Leest, Muskegon, for permission to construct a 15-mile pipe line to serve as an outlet from the Burnips oil field, Allegan County. The line would extend from the field to Holland, on Macatawa Bay, a Lake Michigan port.

Existing outlets are capable of transporting only 1400 of the field's 6000-barrel capacity, according to Vander Leest. The field consists of 400 acres of producing oil land and includes another 1600 acres of proved ground. Oil reserves are estimated by Vander Leest at 9,000,000 barrels.

Michigan Field Gets Outlet

Construction has been started on 9 miles of 3-inch oil pipe line by State Refining & Pipe Line Company from the Salem field in Allegan County to railroad shipping racks at Hudsonville, Michigan.

Ernest Wellman, president of the company, said a market for 2000 barrels of crude from the field daily has been secured by his company. It will be placed in service within six weeks, he said.

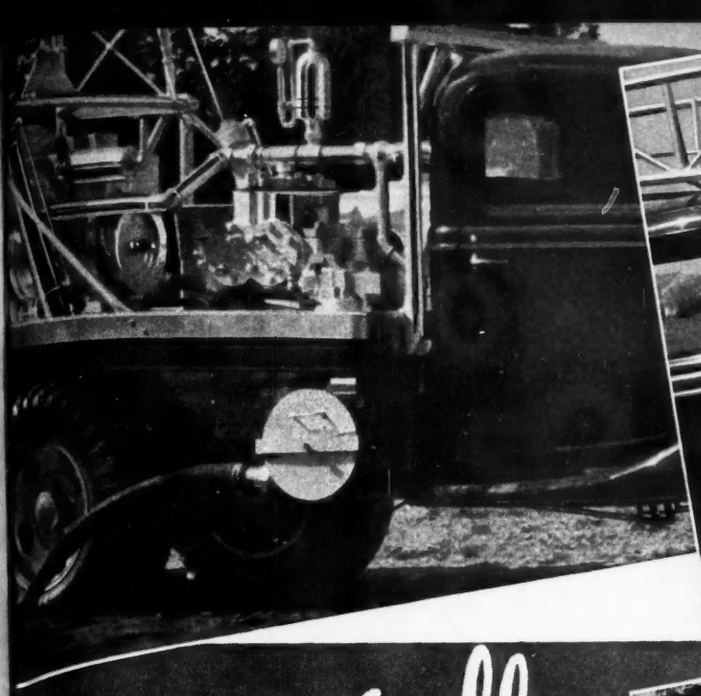
The short line will be the first pipe line outlet for the field opened in February of this year. All production, about 700 to 900 barrels daily, has been trucked.

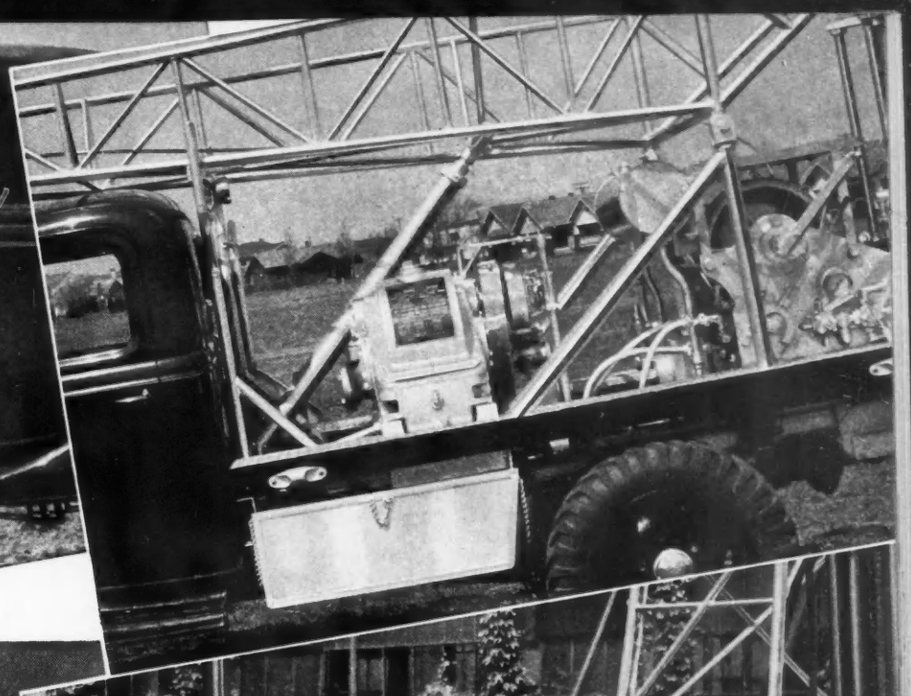
Keenan elected president of West Virginia Association

Charleston, W. Va.—D. S. Keenan, general superintendent of the United Carbon Company, Charleston, was named president of the West Virginia Oil & Natural Gas Association at the organization's annual meeting held here September 8-9. He succeeds John P. Flynn, Sistersville.

Other officers named are D. A. Ketchum, vice president of the United Fuel Gas Company, Charleston, vice president, and Edwin Robinson, Fairmont, re-elected secretary-treasurer.

Directors named are: Flynn; E. F. Daubenspeck and S. R. Williams, Parkersburg; Wallace Gribble, Clarksburg; O. W. Van Patton, Hugh Burdette, and W. J. Hightower, Charleston; Scott C. Lowe, Fairmont; W. P. Kerwood, St. Marys; George H. Hinerman, Weston;





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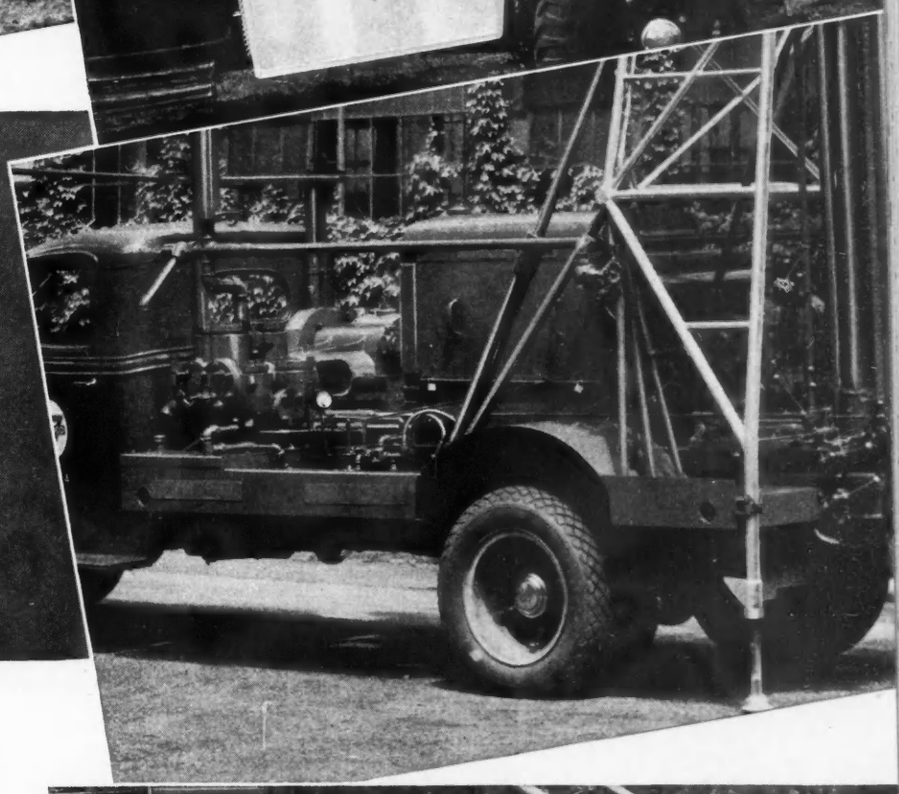

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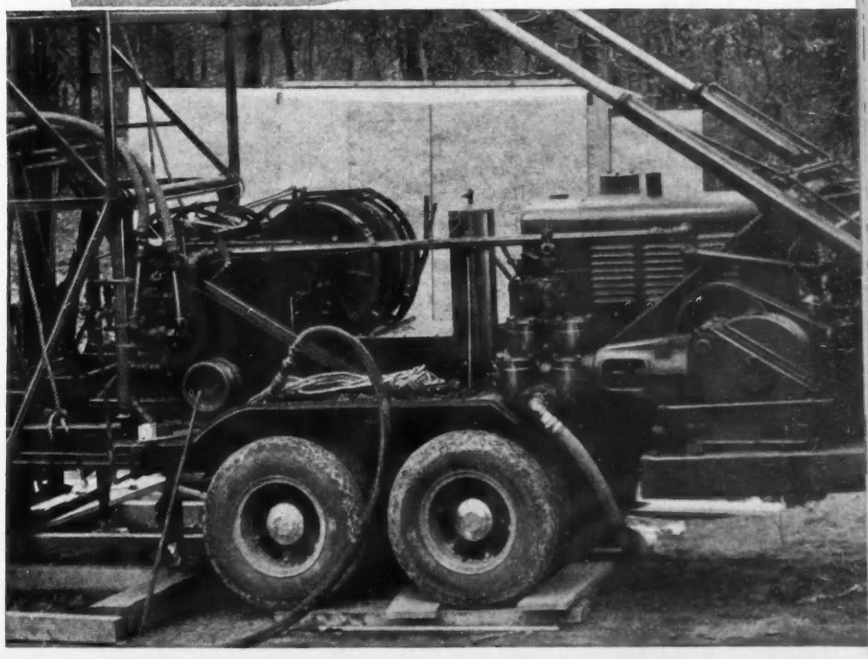

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Dr. James B. Garner, of the Mellon Institute at Pittsburgh, discussing "Natural Gas and Its Various Uses," described uses to which this resource is put in chemical industries and scientific and medicinal laboratories. He pointed out that it is not a simple substance, but a complicated one containing more than 20 different elements, each of which has its own physical and chemical properties.

Technical Discussions

Technical discussions were given by C. P. Parsons, Duncan, Oklahoma, on "Plugging Back with Cement to Shut Off Water"; F. W. Floyd, Tulsa, Oklahoma, on "Rotary Drilling"; and H. R. Pierce, Ashland, Kentucky, on "Improving Production of Oil by Repressuring and Other Methods."

Dr. Paul H. Price, West Virginia state geologist, traced the history of oil and gas development in the state, stressing that depletion of present pools is in sight and that future supplies must come from more efficient recovery methods, deeper drilling and synthetic fuels. He urged underground storage of gas by pumping back into the earth during off-consumer seasons to prolong the life of state fields.

A suggestion to operators that might result in salvaging part of their investment when tests result in dry holes was given by the geologist:

Make Salt Water Well Pay

"I should like to ask each one of you, when you encounter a large volume of salt water that appears to be highly concentrated, to send a sample to our survey department for an analysis," he said. "It may be that an otherwise dry hole can be converted into a paying salt well."

He called attention to a recent survey showing the state's reserve of salt brines totaled at least 800,000,000 tons. "Such a reserve could, at the rate of 20,000,000 tons a year, supply the world for about 40 years," Dr. Price added. "It is thus obvious that West Virginia has salt reserves adequate for even a much expanded West Virginia industry for generations to come."

IPAA Convention committees named

Anticipating the largest attendance in the history of the association, George A. Hill, Jr., general chairman of the Independent Petroleum Association of America's annual convention, to be held in Houston October 14-16, has appointed a large group of committees, which met for the first time last week and mapped a general outline of the three-day program. It is expected that more than 500 IPAA members will come to Houston especially for the association's meetings, and others probably will arrive sooner so as to attend the oil Oil World Exposition, which runs during the entire week of October 11-16.

The committees appointed by Hill are as follows:

General Reception Committee: T. J. Donoghue, chairman; L. L. Adkins, J. S. Abercrombie, James Anderson, V. E. Ashford, Allan C. Bartlett, Ben Belt, Mills Bennett, Jim Birmingham, W. N. Blanton, John W. Blue, Palmer Bradley, Philip H. Broun, P. D. Brown, W. L. Childs, H. Merlyn Christie, F. S. Coggeshall, J. W. Colvin, George W. Cottingham, H. J. Craig, Judge W. O. Crain, H. R. Cullen, Craig Cullinan, John T. Crotty, W. H. Curtin, W. A. Davis, John Deering, E. L. De Golyer, John W. Ditmar, C. B. Edwards, James A. Elkins, S. P. Farish, Oph Farmer, Roy Farrar, M. E. Foster, Charles I. Francis, J. R. Gahan, L. P. Garrett, H. B. Gillette, John E. Green, Jr., S. Marcus Greer, B. D. Harris, Dan Harrison, Harry Hanszen, Winston Henry, George Heyer, Geo. A. Hill, Jr., Gillette Hill, Gov. W. P. Hobby, L. E. Hodges, Mike Hogg, Burton E. Hull, N. W. Hunter, W. H. Irvin, Joe M. Jackson, Robert James, A. M. Johnson, Ralph Johnston, R. A. Josey, R. C. Kuldell, F. M. Law, E. G. Lenzner, Edmond L. Lorehn, P. George Maercky, F. A. Marsh, Roy Miller, H. W. Millmine, L. Mims, Clifford Mooers, Adrian Moore, Dan J. Moran, S. M. McAshan, W. R. McClendon, A. M. McCorkle, A. T. McDannald, J. H. McEvoy, V. V. McGrew, Fred McManis, J. R. Neal, J. W. Neal, E. J. Nicklos, W. S. Noble, Geo. O'Leary, C. R. Patterson, A. J. Penick, Tom Pew, Merrick Phelps, Louis Pierce, W. W. Plowden, Albert Plummer, W. B. Pyron, Joe Russell, Bert Ryan, Ed Salrin, Geo. Sawtelle, J. T. Scott, W. R. K. Scott, Ed Seamans, A. L. Selig, W. B. Sharp, W. A. Sherman, E. A. Showers, A. D. Simpson, E. R. Smith, Howard F. Smith, Gov. R. S. Sterling, R. E. Stevens, Geo. Strake, John R. Suman, Chase Sutton, T. E. Swigart, John H. Teer, Don H. Thornbury, F. H. Thrailkill, P. B. Timpson, E. E. Townes, George Tyson, A. S. Vandervoort, Jr., Walter B. Van Wart, A. S. Weaver, Harry C. Weiss, J. M. West, R. W. Wier, Wallace D. Wilson, J. O. Winston, Jr., T. T. Word.

Attendance Committee

Committee on Attendance: E. A. Showers, chairman; Paul C. Benedum, Henry A. Bourne, Jr., S. P. Brown, Charles E. Buchner, Jr., Cliff Byron, L. A. Casey, R. H. Christy, O. W. Dyer, Geo. H. Echols, Jack Frazier, Stanley Gill, Tulane Gordon, W. L. Goldston, Harry C. Hanszen, Sam G. Harrison, R. S. Hyer, Geo. B. Journeay, R. O. Lowrance, F. L. Luckel, Geo. I. Lynch, Paul R. Mills, Robert J. Miller, A. T. McDannald, H. L. Patton, C. G. Porter, H. M. Richter, Nowery J. Smith, A. C. SoRelle, E. A. Steen, Carl W. Vogt.

Committee on Exhibits: C. E. Buchner, chairman; M. M. Albertson, Donald C. Barton, Walter Curran, R. L. Dabney, Ford Fullingim, M. T. Halbouty, Hu M. Harris, Herbert S. Lane, E. G. Lenzner, E. L. Moseley, M. C. McGehee, Jr., John C. Schultz, Dick Schwab, R. A. Stamey, Gerhard Stubbe, W. V. Vietti.

Committee on Decorations: W. S. Noble, chairman; J. F. Bashara, C. C. Bishop, Howard Boyles, Geo. S. Buchanan, L. W. Capps, H. Merlyn Christie, W. C. Coolidge, Chas. Cryer, J. B. Cutbirth, Phil E. Davant, H. J. De Arman, L. H. Dunn, C. M. Frost, M. L. Harwell, Maurice Hirsch, Sidney Judson, Paul Kayser, Geo. I. Lynch, H. R. Merry, L. H. Pitkin, K. M. Regan, Geo. H. Rose, Floyd L. Senter, Harry Susman, W. S. Winn, James E. Winston, Jr.

Committee on Entertainment: H. R. Cullen and Frank Carothers, chairmen; J. T. Bertrand, James M. Boyle, David D. Bruton, James H. Bute, Frank E. Crimmins, N. C. Cummings, E. E. Fogelson, R. R. Frankel, J. H. French, H. G. Frost, Clyde Goza, Lee Hager, John M. Jennings, J. H. Meek, Jr., F. J. Miller, Gray I. Morriss, M. A. O'Brien, W. B. Sharp, J. Elmer Thomas, E. I. Thompson, J. Z. Werby, C. B. Wrightsman.

Committee on Program: Winston Henry, chairman, E. E. Beatty, C. B. Bunte, D'Arcy M. Cashin, H. C. Cockburn, J. W. Colvin, Claude B. Hamill, Jno. Hamman, R. A. Irwin, J. E. Josey, Carl I. Olsen, Tom Pew, E. E. Rosaire, E. R. Smith, Chase Sutton, R. J. St. Germain, Paul Teas, A. W. Thompson, T. J. Wood, Walter Young.

Finance Committee

Committee on Finance: George Sawtelle, chairman; J. S. Abercrombie, Ed. Bannon, Mills Bennett, V. H. Borsodi, A. F. Brown, Earl H. Butler, H. Merlyn Christie, J. A. Coulson, Jno. T. Crotty, John Dorrance, J. B. Durkee, C. B. Edwards, Harry L. Edwards, T. E. Failing, S. P. Farish, F. Julius Fohs, W. W. Fondren, Lee Hager, Earl C. Hankamer, Dan Harrison, Karl F. Hasselmann, W. H. Hodnett, N. W. Hunter, J. Collier Hurley, R. A. Irwin, Geo. E. Justice, Carl O. Keels, R. C. Kuldell, McDonald Meachum, Glenn McCarthy, D. B. McDaniel, Geo. O'Leary, G. C. Parmlee, J. R. Parten, C. R. Patterson, D. D. Peden, Albert Plummer, Cal M. Shugert, E. L. Stone, Austin B. Taylor, J. R. Turnbull, Bryan Ward, J. M. West, Wallace D. Wilson, J. O. Winston, Jr., Geo. F. Zoffman.

Committee on Hotel Reservations: Haygood Ashburn, chairman; J. E. Boone, H. D. Brennand, Philip H. Broun, I. H. Brown, R. Bruce Carter, E. C. Fantham, R. D. Farish, M. T. Glass, Carl Hickman, H. B. Jordan, M. M. Kinley, R. S. Lester, E. G. Lenzner, J. C. Means, J. S. Mickelson, J. C. McKallip, Donald W. Moore, A. E. Naman, W. C. O'Leary, B. F. Orr, T. L. Powell, Carlton D. Speed, Jr., Paul Wise, Basil Zavoico.

Committee on Transportation: Geo. W. Strake, chairman; T. A. Carlton, Ben Coyle, Lon H. Cron, Wynn Crosby, Craig Cullinan, Pat Davis, Alexander Deussen, C. M. Dow, Lester A. Gillespie, Bert Gray, R. R. Hobson, Mike Hogg, C. N. Housch, Le Noir Josey, L. A. Layne, J. M. Lykes, Clifford Mooers, Wm. F. Morgan, J. R. Neal, Earl North, Albert Plummer, Pat Rutherford, Robert E. Smith, Martin Thompson, E. R. Turner, Clarence A. Wiggins.

Institute issues code of metallurgical terms

A code of metallurgical terms for ferrous alloys has been issued by the Division of Production of the American Petroleum Institute. About 200 terms in use in the petroleum industry are defined in the code, which was prepared to promote uniformity of meaning in the usage of metallurgical terms when applied to oil field equipment. The booklet, consisting of 16 pages, also contains S.A.E. specifications for carbon, chromium, tungsten and other steels, and hardness conversion tables. The code sells for 25 cents per copy, with discounts in quantities.

WORLD DEVELOPMENT and TECHNOLOGY

Edited by
WM. V. GROSS, Associate Editor

Agree to Prorate

TURNER VALLEY ALLOWABLE IS 65 PERCENT OF POTENTIAL

VOLUNTARY proration in Turner Valley field, Alberta, Canada, limiting production to 65 percent of each well's capacity, was inaugurated by operators September 11, five days after Davies Petroleums, Ltd.'s No. 2 on the west flank came in as the biggest well yet drilled in the Dominion. Initial production was 2645 barrels of 44.7 degree crude, worth $1.40 a barrels.

The proration agreement was drawn up at a conference of producers with Hon. N. E. Tanner, minister of lands and mines, in Calgary, and is intended as a temporary measure pending depletion of crude in storage. Production will be handled under contract with the Imperial Oil Company and the British American Oil Company, principal crude buyers in the field.

Whie proration is in effect, a study of the situation will be made by the producing companies, with the assistance of all available statistical information from the department of lands and mines and other sources, according to Herbert Greenfield, president of the Oil & Gas Association of Alberta. Refinery companies have pledged their best efforts to expediate consumption of Turner Valley crude through extension of the marketing area in the western provinces.

Canada's Record Gusher

Located on Legal Subdivision 13, Section 21, Township 18, 2-w5, the Davies Petroleums, Ltd.'s No. 2, was completed at 6965 feet. It was the first Canadian well to be completed by use of a compressor. The rotary fluid was first cleared from the 2800-foot level, tubing lowered and the lift applied. It blew in under a pressure of 1400 pounds as built up by the compressor.

As expected, production dropped off somewhat but was well above 2100 barrels per day as the week closed. A yield of 2298 barrels was obtained the second 24 hours, and 2144 barrels the third 24 hours. Tubing has not been adjusted to the correct gas-oil ratio. The gas flow, estimated at more than 7,000,000 cubic feet, is larger than normal for the west flank, and will later be hooked up to Royalite Oil Company's absorption plant. The Royalite company drilled the test.

Battleview Wildcat Looks Good

On the Battleview structure, 23 miles northeast of Wainwright, the wildcat of Battleview Oils reported a sensational gas flow in a sand topped at 1870 feet. Unofficial estimates of the flow, which blew 1400 feet of rotary mud from the hole carrying some light brown crude with it, ranged up to 50,000,000 cubic feet. Gas had previously been encountered at 1424, 1625 and 1710 feet. A 24-foot core taken in the present formation dripped crude oil. Eight-inch casing had been set to 1886 feet and the well deepened to 1893 feet when the blow occurred.

Following a seismograph survey of the structure last year, oil sands were predicted at three different horizons between 1800 feet and 3500 feet. The main producing horizon is indicated at around 3500 feet.

If the wildcat proves a good producer at its present depth, it will open a new area to extensive development. Wells can be drilled in the area for about $15,000, and Battleview Oils has already made arrangements for No. 2, while Pacalta Oils and South End Petroleums are also planning tests. Location of the wildcat is the northwest quarter of Section 32, Township 47, 5-w4.

Three Due at Taber

On the Taber structure near the international boundary, Plains Petroleum Corporation is planning to bring three tests into production within the next two weeks. No. 1 penetrated a heavy saturated sand believed to be the Ellis series from the 3000-foot level and is now bottomed at 3310 feet. After four attempts, it is believed a shut-off was obtained by a formation tubing squeeze job completed last week. No. 2 is bottomed at 2700 feet with casing set at 2560 feet. On drilling deeper, 8-inch casing will be set at 2710 feet and 7-inch casing carried to the first production zone, 3200 feet. At No. 3, 8-inch casing has been set at 2700 feet. New hole is being made at the rate of approximately 100 feet a day. The wells will be brought into production by Mose Wagner, who has brought in over 350 wells in the Montana fields.

There were 36 Active Rigs in Turner Valley as the week closed.

Canadian Wildcats Active

The following reports were received from West Canadian wildcat structures: On Birch Ridge, Elbow Oils Company, drilling at 5198 feet; on Calling Valley, Anglo-Indian Oils Corporation, building derrick; Sentinel Oils, resuming at 5850 feet; on Cardston, Franco Oils, cleaning at 4580 feet; on Clearwater, Western Development Company, drilling at 142 feet; on Coutts, Home Oil Company's Coutts 1, drilling at 2250 feet; on Duncan, Spindletop Oils, casing at 1600 feet; on High River-Aldersyde, Ranchmen's Gas & Oil Company waiting at 7225 feet; on Highwood-Sinclair, Green Valley Petroleums' Banner, drilling at 3158 feet; South End Petroleums, cementing at 5500 feet; on Hunter Valley, Hunter Valley Oil Company, drilling at 8189 feet; on Kootenay Dome, Roxana Petroleums, drilling at 3227 feet; on Lethbridge, Lethbridge Petroleums, casing at 2198 feet; on Moose Dome, Moose Oils' No. 2, testing at 1553 feet; on New Valley, New Valley Oil Company, fishing at 8462 feet; on Pincher Creek, Weymarn Petroleums' No. 2, giving acid treatment at 6432 feet; on Ribstone, Dina Oil & Refining Company's No. 4, drilling at 1023 feet; London-Ribstone Petroleums' No. 2, testing with no depth reported; on Steveville, Anaconda Oil Company, fishing at 615 feet; on Wainwright, Altoba Oils, building derrick; on Watson, Mar-Jon Oil Company's No. 3, changing from cable tools to rotary equipment at 5520 feet; Mar-Jon-Maxmont Syndicate, drilling with no depth reported.

ALL-TIME RECORD Turner Valley August runs are 232,577 bbls.

An all-time record for deliveries of Turner Valley crude for Imperial Oil Company, Ltd., and British American Oil Company, Ltd., principal buyers in the Alberta field, was established in August with a total of 232,577 barrels. Imperial's purchases totaled 161,161 barrels, including 1544 barrels of naph-

tha, 39,165 barrels of discolored naphtha, and 120,452 barrels of crude. British American purchases totaled 71,416 barrels, of which 2664 barrels was naphtha and 68,752 barrels was crude oil.

Steadily increasing production of Turner Valley is reflected in the following comparison of total sales by months since the first of the year: January 101,856 barrels; February 115,818; March 133,216; April 149,467; May 148,066; June 162,071; July 194,134; August 232,577. Purchases for the first eight months of this year totaled 1,237,205 barrels.

NEW ALBERTA PEAK

Record due to Turner Valley production

While Alberta's June production figure of 191,634 barrels was the greatest of any month in the history of Canada, the July figure of 226,000 barrels represents a new peak.

Limestone production in Turner Valley field is responsible for the increase, having accounted for 222,455 barrels of the above total. Turner Valley shallow production amounted to only 917 barrels in July. Other fields included in the July total were Red Coulee, 1242 barrels; Wainwright, 1180, and Diana, 206 barrels, according to figures received from C. W. Dingman, director of the petroleum and natural gas division of the department of lands and mines.

PLAN ALASKA TEST

Report Hanna mapping for three major firms

C. J. Hanna, paleontologist with Tide Water Oil Company, is reported completing surveys and mapping of the area from Cold Bay to Kanatak, Alaska, preparatory to staking tentative location for a wildcat to be drilled jointly by Tide Water Associated Oil Company, Standard Oil Company of California, and Union Oil Company. Word from Anchorage, Alaska, September 8 is that the test probably will not spud until the summer of 1938.

Alaska has one active wildcat, that of Iniskin Drilling Company near Chinitna Bay, 150 miles north of Cold Bay.

PLANS BUSY YEAR

Colon Development is to work 4 Venezuelan areas

Colon Development Company, Ltd., expects to obtain definite, though not necessarily conclusive, information concerning the oil bearing value of Rosario structure, where the organization is drilling a wildcat in the western part of its Venezuelan concession, according to J. E. F. de Kok, chairman of the board.

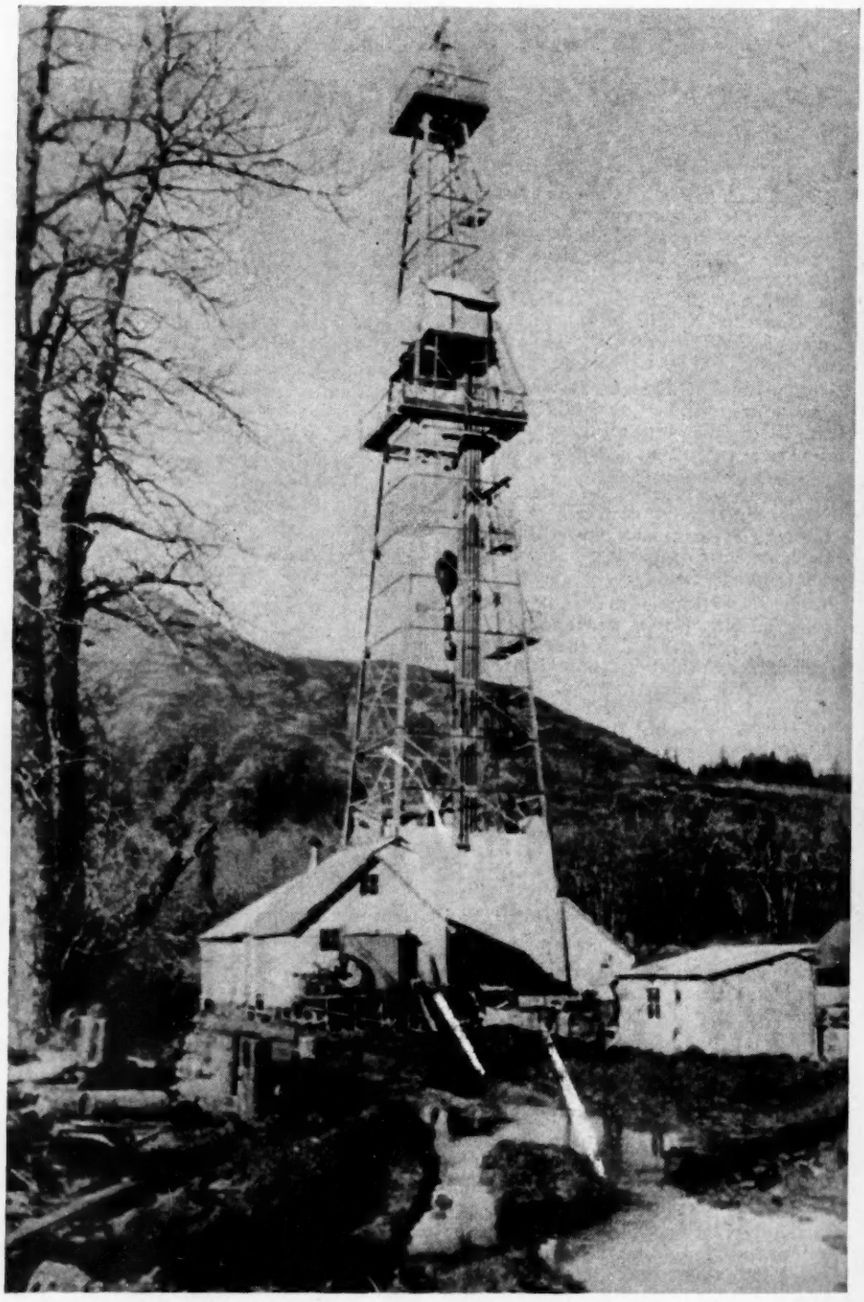
Rosario structure has already received five tests, four shallow and one deep. None has produced commercially.

In addition to its work at Rosario, Colon Development Company, Ltd., has ordered the necessary materials for a deep Venezuelan test to horizons believed to underlie producing zones of the Las Cruces and El Cubo sections of Tarra field, near the Colombian border. The company has been busy with seismic work in Tarra this year to determine where to spot the deep test when the equipment arrives. It is believed the deep zones to be sought for will be found to correspond with formations outcropping a considerable distance south, over the Colombian border, De Kok stated. These are producing in the Barco concession.

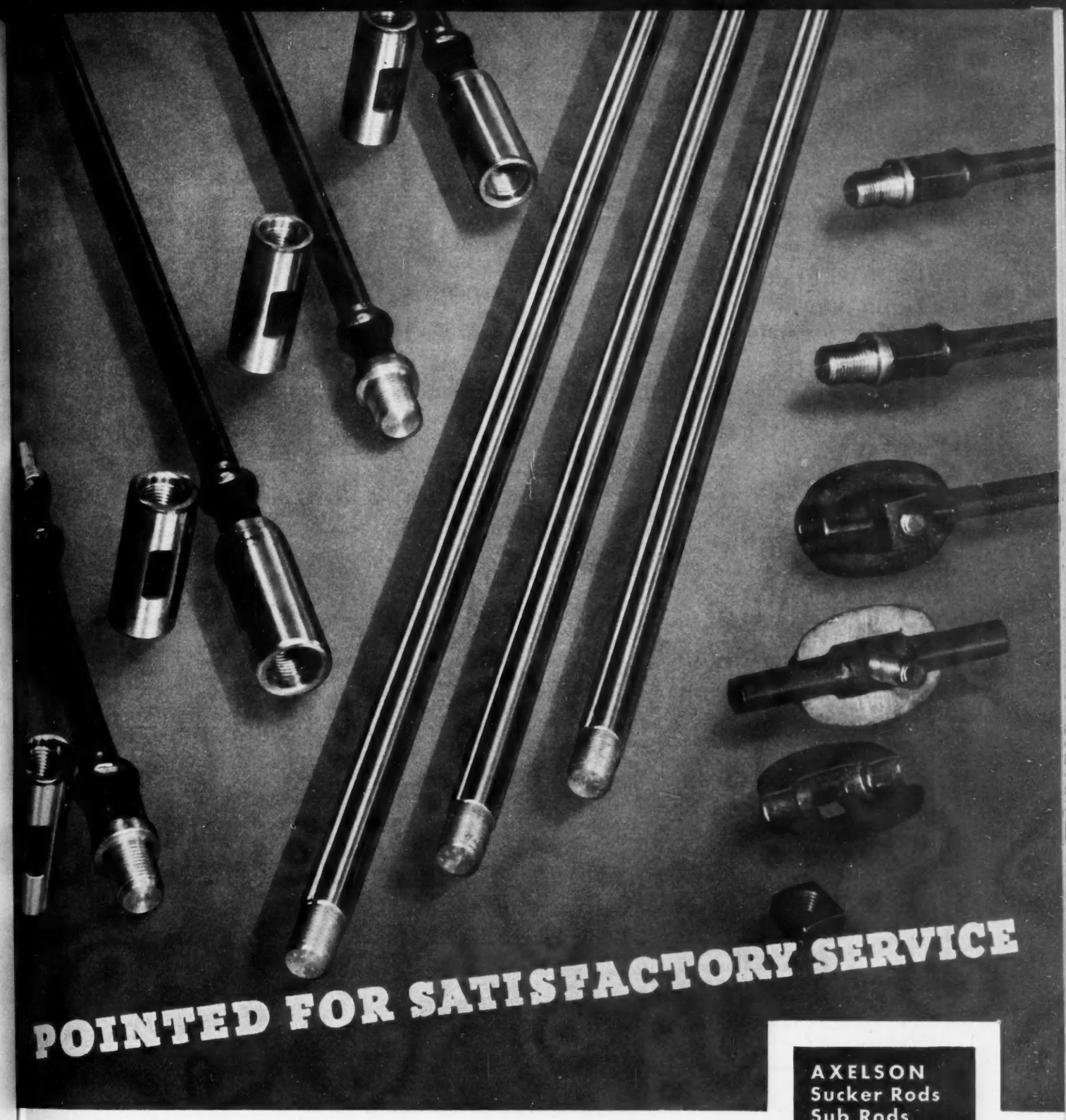
Upon completion of seismic work in the Las Cruces and El Cubo sections of Tarra field, the crews will be shifted to the extreme southern portion of Colon's concession where the Tarra anticline still is in evidence. The 20 kilometers between the future scene of seismic work and the present scene is comprised of dense jungle and is inhabited by hostile Indians, probably Motilones or a related tribe, who have killed or injured several employes of the company.

Colon is working over the eastern portion of its concession with gravimeters as a preliminary step to possible additional work with seismograph. This portion of the concession is covered with alluvial deposits. Very little is known of the geology of these.

Tarra field was discovered by Colon Development Company's Toldo 1, which produced from 875 feet when



Iniskin Drilling Company's wildcat which is seeking production six miles inland from Chinitna bay, Alaska. Pretty soon the test will have to shut down for the winter. Russell Havenstrite of Los Angeles is president of the Iniskin organization.



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completed August 27, 1916. Producing formations have since been found from 850 feet to 4252 feet. The oil has an asphalt base and ranges in gravity from 22.6 to 30.2 degrees. Tarra is in the southern part of the Colon district, State of Zulia, and 8 miles south of Los Manueles field.

RAILROADS MAY DRILL

Plan to develop fuel for Mexico's trains

Oil exploitation by railroaders as a means of assuring the National Railways of Mexico and other railroads in that country constant and adequate fuel supplies, is the objective of a plan the national railroad workers union is developing. Such exploitation would be in oil zones along the right of way of the railways that would second the proposition. Sponsors of the plan say it would guarantee steady railroad operation by providing a constant fuel service by making the railways independent of oil industry strikes or other tieups. It is claimed that oil thus obtained would be cheaper than that obtained from the petroleum companies.

ENGLISH WILDCAT

No showings reported in Anglo-American project

Anglo-American Oil Company's wildcat at Grove Hill, near Hellingly in Sussex, England, is reported drilling below 2600 feet without having encountered any showings of commercial significance.

At 2300 feet the drill was in the Corallian, part of which outcrops on the Dorset coast. It is a hard formation, calling for slow drilling. Objective depth of the wildcat is between 4000 and 5000 feet, according to reports.

East Venezuela map

International Map Company, 90 West Street, New York, recently published a seven color map of Eastern Venezuela showing concessions of the major companies, oil fields, wildcats, pipe lines, state and district capitals, and automobile roads. The map sells for $10. Scale is 1:750,000.

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Murray County test has interesting saturation.

* * *

Billings edge completions make good oil flows.

Ardmore. — Southern Oklahoma oil operators were keeping close watch on a well in Murray County last week, which may open a new producing area, having encountered saturation at 4093 feet. The test is Power Oil Company et al's Lancaster Trust Company 1, CSW NE 10-1s-2e, southeast of Davis.

The test went into the sand only a few feet. The well has had considerable trouble since it first started drilling on August 4, 1936. Operations went ahead at the test until April, 1937, when it was shut down after plugging back to 3175 feet. In June, cellar and pits were enlarged, rig rebuilt and rotary tools moved in. After drilling was resumed, a show of oil was found in the Viola lime at 3383 feet, and a six-foot core from 3586 to 3592 feet showed the bottom dry and the top having an odor of oil. The hole was six degrees off vertical at 3442 feet. Whipstock was set at 3392 feet and it drilled by the pipe, then went on down for the show of saturation reported last week.

Another fill up was reported from Ed Parsons et al's Blake 1, CSW NW 22-2n-8w, southwest of Marlow in Stephens County. At 4985 feet operators found 850 feet of oil in the hole. It was coming from an upper sand in the hole however, and was soon exhausted and drilling was going ahead below 4985 feet. The tets had been showing for 25 to 35 barrels of oil at 4966 feet and higher.

Milroy Well Testing

Carter Oil Company et al's Harley Community 1, CNE NE 24-2s-4w, just south of the Milroy area of Stephens County, continued testing. It made 1708 barrels of oil in 15½ hours September 12, and during the next 9½ hours flowed 1061 barrels of oil. Bottom hole pressure dropped from 3690 to 3310 pounds, and it was making about seven barrels of salt water per hour.

Across the line, in Carter County, the second deep test for the immediate area was getting started. It is Carter Oil Company's Carter-Harley 1, CNW NW 19-2s-3w, and was rigging up rotary tools. An exclusive Carter property, the test is a due east offset to Harley Community 1, and is at the extreme northwest end of the old Fox pool.

In the same area, Gulf Oil Corporation's Smith Estate 1, CSW SW 26-2s-3w, was coring at 5442 feet. Top of the Hunton lime was found at 4615 feet; top of the Sylvan shale at 5127 feet. A core from 5119 to 5129 feet had a recovery of lime with a show of oil and a second core between 5430 and 5440 feet had a seven-foot recovery of Sylvan shale and some lime. Gulf's Johnson 1, CSW NW 27-2s-3w, was drilling below 5875 feet in Viola lime.

Head flows at Indian Territory Illuminating Oil Company and Foster Minerals Corporation's Graham 1, SWc NE 1-3s-19w, discovery in the Canyon lime formation and located south of Frederick in Tillman County, interfered with running of three-inch tubing. The well made 414 barrels of oil in one 24-hour flow. It is believed the well will make around 750 barrels of oil daily when completed.

Lincoln presents Billings pool with north extension

Oklahoma City. — Most interesting news from the Oklahoma City sector last week was the northern extension of the Billings pool of Noble County. Lincoln Petroleum Company and Rudco Oil & Gas Company's Conway 2, NWC SE 16-23n-2w, made 1609 barrels of oil in eight hours while drilling to 4316 feet in the Wilcox sand. Tubing was to be run for a potential, and the operators estimate the well good for about 400 barrels an hour.

At the west edge of the pool, a big well was Continental Oil Company's Conway 8, SW NE NW 21-23n-2w, which made 1660 barrels of oil in three hours while pulling drill pipe from 4310 feet in the Wilcox sand.

At the south end of the Lucien pool, in Logan County, Champlin Refining Company's Pfeiffer 6, NWc 4-19n-2w, was bailed in and flowed 456 barrels of oil and was shut in to wait on tankage. It was making an estimated 8,000,000 cubic feet of gas. Champlin's Pfeiffer 7, SW NW NW 4-19n-2w, topped the second Wilcox sand at 4885 feet and drilled to 5036 feet where it flowed 1766 barrels of oil in 20 hours. It was then drilled ahead to 5039 feet and while drilling made 389 barrels of oil in three hours, with an estimated 3,000,000 cubic feet of gas. It was to be drilled deeper.

Grant County Well Improves

In Grant County, Carter Oil Company et al's Crisman 1, CW½ SW NW 16-25n-3w, made 339 barrels of oil and 167 barrels of water, a considerable improvement over previous production. During the last eight hours of the flow it averaged 30 barrels of oil and 17½ barrels of water through tubing. Packer was set at 5406 feet and swabbing operations started Sep-

tember 13. The volume of water is steadily dropping off.

Sinclair Prairie Oil Company's Rice 3-A, SW NE NE 28-10n-2w, in the Moore pool of Cleveland County, at 7250 feet in dolomite was bailed to bottom and had a slight show of oil and gas. It was acidized with 6000 gallons and drilled deeper under pressure. Top of the Wilcox sand was at 7266 feet and it was drilled ahead to 7286 feet, bailed to the bottom but refused to flow. Operators were running drill pipe and were to put gas into the well through the pipe to force a flow.

Test Makes Poor Showing

A poor showing was reported by Mid-Continent Petroleum Corporation's Bulling 3, NW NE NE 5-19n-2w, which cored from 5068 to 5078 feet and recovered eight feet of sand and sandy dolomite, with a very slight show of dead oil. Top of the first Wilcox sand was at 5067 feet. Another core from 5078 to 5096 feet yielded 15 feet of white sand with an odor of gas. A third core from 5096 to 5103 feet had a five-foot recovery with another slight stain of dead oil.

On the west side of the Edmond field of Oklahoma County, Magnolia Petroleum Company's School Land 2, SE NE NE 36-14n-4w, plugged back to 6400 feet, then perforated casing from 6355 to 6366 feet in the Chicken Farm sand. It made 18 barrels of oil in one flow and 2,750,000 cubic feet of gas. It was to be acidized through perforations.

Pine's Wilcox sand strike in Seminole County starts three

Tulsa.—Latest interest in the Tulsa sector continued to center around the recent Wilcox sand strike in Seminole County, where three more tests are being started. The well which started the activity was W. B. Pine's Amosan 1, SEc SW 15-6n-6e, west of the Konawa pool in southern Seminole County. At 3781½ feet in the second Wilcox sand it flowed an estimated 500 barrels of oil in one hour and 50 minutes. After having been shut in for several days, it was opened and flowed 1946 barrels of oil in approximately 6½ hours, cutting 3 percent sulphur water.

Pine has made location for Amosan 2, SWc SE SW 15-6n-6e and Amosan 4, SWc 15-6n-6e. Atlantic Refining Company made location for Damron 1, NEc NW 22-6n-6e, a due south offset to the discovery well.

Outlet for the new producing area will be provided by The Texas Pipe Line Company.

Oil at the discovery continues to show sulphur water, but in decreasing amounts. Earlier in the week it was showing about 20 percent. The well is making an estimated 3,000,000 to 3,500,000 cubic feet of gas.

Makes Record Time

Ardie Oil Company's School Land 1, NEc SE 16-14n-4e, southeast of Chandler in Lincoln County, reported a record run last week. The well drilled 4510 feet in 10 days. It had the Brown lime at 4360 feet; topped the Mayes lime at 4480 feet and went to the total depth before stopping. It found the Mayes 58 feet higher than a dry hole at NWc 16-14n-4e and 155 feet higher than The Texas Company's Gessman 1, SEc NE 33-14n-4e.

In the Wilzetta area of the same county, Amerada Petroleum Corporation's Luder "B" 1, NEc SW 10-12n-5e, topped the Brown lime at 3940 feet, had the Mayes at 4085 feet; topped Woodford shale at 4255 feet; Misener sand at 4305 feet and went into the Hunton lime at 4307 feet, where it had a show of oil. The well topped the Sylvan shale at 4385 feet, and after drilling to 4480 feet in the Viola lime, topped at 4473 feet, the well was to run to 7-inch casing at 4479 feet and rig up standard tools.

Magnolia Petroleum Company's Cradduck 2, SW SE SE 24-2n-6e, farthest northwest well in Fitts field, made a potential of 2189 barrels of oil from the Hunton lime.

OKLAHOMA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARTER COUNTY—		
Kewanee O&G., Hickman-Willis 16, nw ne se 6-4s-3w	79	1169
COMANCHE COUNTY—		
Frank Scott et al, Kountz 1, sw ne se 21-4n-11w	*	2800
CREEK COUNTY—		
A. W. Swift et al, Buell 2, ne ne nw 13-19n-9e	*	2070
GARVIN COUNTY—		
Texas, Hector Derdeyn 16, ne sw ne 17-1n-3w	30	1752
HUGHES COUNTY—		
Amerada & Stanolind, Williams 1, se se se 36-9n-8e	121	4029
JEFFERSON COUNTY—		
Circle Oil Co., Seay 50, se se sw 3-7s-5w	75	1270
KAY COUNTY—		
Higdon et al, Nieman 2, ne nw ne 9-26s-3w	*	350
LINCOLN COUNTY—		
Sun Oil Co., Arinwine 3, nw se se 35-15n-2e	937	5141
LOGAN COUNTY—		
W. R. Curry et al, Schlopp 2, se se se 32-20s-2w	3420	5040
NOBLE COUNTY—		
Phillips & Shell, O'Neil 5, nw nw se 16-23n-2w	1768	4264
OKFUSKEE COUNTY—		
Helmerich & Payne, A. Robinson 2, ne ne se 26-10n-10e	¶18	3237
Grimes, Wind 7, nw se ne 35-11n-9e	8	1496
OKMULGEE COUNTY—		
Lease Inv. et al, Reneau 4, nw se nw 4-13n-11e	80	3185
Barnsdall, Wiley 1-A, ne ne ne 29-13n-14e	*	2550
D. W. Howard, A. J. Rentie 2, se sw ne 18-14s-15e	*	1302
OSAGE COUNTY—		
Moore et al, ne nw sw 34-2n-9e	*	1068
Barnsdall Oil Co., 24, ne nw se 18-23n-12e	4	1650
Lewis Prod. Co., 5, se sw se sw 28-24n-7e	110	2650
Lewis Prod. Co., 7, se nw ne 33-24n-7e	376	2664
PITTSBURG COUNTY—		
J. E. Weible, Ceasar 1, ne ne se 7-8n-16e	*	663
PONTOTOC COUNTY—		
Crosbie, Burris 2C, nw sw se 22-5n-7e	25	2724
Magnolia, Metropolitan Life Ins. 36, se ne sw 27-2n-7e	486	4135
Sinclair Prairie, Burris 21, nw nw nw 27-2n-7e	157	2665
Amerada, Smith 11, se sw nw 28-2n-7e	102	2376
Magnolia, Burris "B" 14, sw ne ne 28-2n-7e	106	2525
Skelly, Park College 25, sw sw ne 28-2n-7e	106	2515
SEMINOLE COUNTY—		
Malernee, Flowers 4, sw sw se 29-7n-6e	106	2921
I. Troup, Wright 2, se nw nw 32-7n-6e	503	2962
STEPHENS COUNTY—		
Green et al, Green 7, ne ne 27-1s-5w	6	889
TULSA COUNTY—		
Anthony, Wilcox 5-A, csl n½ nw nw 3-16n-12e	100	2300
Cummings, Bruner 3, cwl e½ ne nw 27-17n-13e	30	2027

*Failures; †Junked; ¶Million cu. ft. gas.

Oklahoma completions drop to 31 last week

Tulsa.—Drilling dropped to a low level in Oklahoma last week when only 31 wells were completed, while 40 locations were staked. The completions included 23 oil wells with iintial output of 8735 barrels, 1 gas well and 7 dry holes. Locations included 7 for both Pontotoc and Seminole counties, 3 each for Creek, Oklahoma, Osage and Stevens counties, 2 each in Carter and Tulsa counties, and 1 location for Beckham, Caddo, Garfield, Kay, Kiowa, Latimer, Lincoln, Okfuskee, Pottawatomie counties.

AIME to meet in Los Angeles October 1

Over 400 members of the petroleum division of the American Institute of Mining and Metallurgical Engineers will convene in an all day meeting in the Edison Building at Los Angeles on October 1.

The meeting will be divided into two technical sessions followed by an informal dinner in the evening. Program plans call for the presentation of interesting, practical, and scientific papers concerned with the petroleum industry, and an important feature will be a symposium of recent developments in California oil fields, presented by a number of men who have been actively connected with the new production areas.

The following fields, with the speakers who will tell of their recent developments, will make up the subject matter of the symposium:

Santa Maria—C. R. Canfield, Union Oil Company.

Wilmington—Ed Bartosh, Bankline Oil Company.

El Segundo—L. E. Porter, Richfield Oil Company.

Ten Sections—H. P. Wyatt, Shell Oil Company.

Greeley—W. P. Winham, Standard Oil Company.

Numerous technical papers on widely diverse phases of the petroleum industry will be presented and following is a tentative schedule arranged by the program committee:

"Heat Exchange as a Factor in the Design of Dehydration Equipment," by R. W. French, Continental Oil Company.

"Influence of Connate Water on Permeability of Sands to Oil," by Eldon N. Dunlap, Standard Oil Company.

"Some Considerations in the Selection and Installation of Gravel Pack for Oil Wells," by E. M. Wagner, Kobe, Inc.

"The Effect of Pressure Upon the Viscosity of Air, Methane, and Two Natural Gases," by Dr. W. N. Lacey and Bruce Sage, California Institute of Technology.

"The Role of Geologist in Geophysical Exploration," by W. D. Kleinpell, Consulting Geologist, Bakersfield.

"Some New Conceptions of Petroleum Engineering," by Dr. Stanley C. Herold, Consulting Geologist, Glendale.

Other talks may be scheduled before the meeting is called to order.

Plans for the Los Angeles meeting

are under the direction of R. P. McLaughlin, associate chairman of the Institute's petroleum division, who is assisted by Ernest K. Parkes, Standard Oil Company, program chairman; Emil Hueguenin, of the State Division of Oil & Gas, entertainment chairman; and Herman, the local president of the organization.

Kansas operators start 59 new tests

Wichita.—Completions for the week in Kansas ran well ahead of locations, 59 to 48. The completion list included 44 oil wells with initial production of 55,848 barrels, and 15 dry holes. Distribution of the locations by counties was: Russell 10; Barton and Rice 8 each; Ellis, Harvey, Stafford and Woodson, 3 each; Greenwood 2; Butler, Cowley, Ellsworth, Reno, Sherman and Sumner 1 each.

Refiners to meet

Wichita.—The first of three technical meetings sponsored by the Western Petroleum Refiners Association will be held here September 21, to be attended by refiners from Oklahoma and Kansas. Tulsa and Shreveport will have the other two meetings later in the year.

KANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BARTON COUNTY—		
Continental, Ainsworth "A" 6, se sw ne 33-16s-13w	615	3413
I. T. I. O., Hogan 3, nw sw sw 34-16s-13w	712	3406
Ohio Oil Co., Hirsch 1, nw nw ne 22-19s-11w	1830	3113
Sniclair Prairie, Roth 1, sw sw sw 28-19s-11w	*	3403
Stanolind, Lena Knopp 1, ne ne ne 32-19s-11w (pb 3357)	88	3361
Magnolia, Roetzel 12, se nw ne 24-20s-11w	1828	3553
Helmerich & Payne, Sessler 1, sw sw se 29-20s-11w	*	3423
Max Cohen, Luce 1, sw sw sw 21-20s-13w	*	3578
Texas, L. Hoffman 4, ne ne nw 6-16s-13w	2085	3375
CHASE COUNTY—		
Cali.f-Ill.-Kans. Oil Co., Hughes 1, sw nw se 13-22s-9e	17	2611
COWLEY COUNTY—		
Foster & Warren, Elrod "A" 1, ne nw se 6-32s-5e	25	2331
Texas Company, Craston 1, ne se sw 19-32s-6e	40	2242
ELLIS COUNTY—		
Gulf Oil Corp., Clause 1, sw se sw 7-11s-16w	1749	3336
Sinclair Prairie, Cress 2, se se ne 13-11s-17w	1365	3343
Margay, Bemis "B" 6, sw se sw 15-11s-17w	2380	3408
Empire, Bemis 10, sw sw se 21-11s-17w	2025	3384
Johansen 2, ne nw ne 22-11s-17w	988	3449
Ryan Consolidated, Bemis "B" 5, se se nw 22-11s-17w	2460	3444
Deep Rock, Baumer 18, nw ne ne 27-11s-17w	3338	3392
Baumer 16, nw se nw 27-11s-17w	2935	3555
Transwestern, Solomon 1, ne ne nw 33-11s-19w	850	3636
Phillips, Shutts 3, se se ne 5-12s-17w	729	3522
West Kansas O&R Co., Schmeidler 1, nw nw nw 22-12s-17w	*	3760
Texas, F. A. Bemis "A" 10, sw ne ne 28-11s-17w	2307	3481
ELLSWORTH COUNTY—		
Fred Jones et al, Meyers 2, nw sw nw 18-17s-10w	1236	3314
Phillips, Patzner 4, se sw nw 30-17s-10w	2509	3299

Frank Hudson may open new pool in Sedgwick County.

* * *

Offset to discovery well of Trapp is showing oil.

* * *

Stafford County wildcat has showing at 2960 feet.

Company, Well and Location	Init. Prod. Bbls.	Depth
GREENWOOD COUNTY—		
Duncan, Schindler 1, cwl s½ sw sw 16-23s-13e	50	1751
Superior Oil, Jones 14, sw ne sw 21-23s-13e	96	1728
Okoa Oil Co., Lovitt-McNeil 9, ne ne sw 22-23s-13e	75	1583
Cleveland Oil, Nixon 2, se nw se 6-24s-13e	*	1619
Shull Drlg. Co., Allis 8, ne sw nw 17-24s-13e	*	1625
Mendenhall & Landon, Gilray 3, se se nw 5-25s-13e	20	1520
Youker & Davis, Olson 1, se se nw 28-26s-9e	*	2828
Davy et al, Burns 1, ne ne sw 2-28s-12e	*	1604
McPHERSON COUNTY—		
Continental, Kindblade 4, sw se sw 20-21s-1w	390	3320
Continental et al, Haetzke 9, cw½ w½ ne 29-21s-1w	770	3310
RENO COUNTY—		
A. M. Ballard, Skelly 1, nw se ne 16-24s-4w	589	3378
RICE COUNTY—		
Bridgeport et al, Habiger 1, nw nw nw 5-18s-10w	4027	3016
Stanolind, L. F. Manke 1, sw sw se 28-19s-10w (pb 3261)	*	3269
Manke 2, se sw se 28-19s-10w (pb 3257)	*	3257
W. J. Hathaway 2, sw nw sw 33-19s-10w	2440	3292
Saco, Wickerham 2, sw se se 17-21s-9w	*	3309
Gulf, Malone 4, ne nw ne 18-20s-9w	1813	3321
Republic Nat'l, Oden 3, ne nw nw 5-21s-7w	893	3336
Garden & Haimes, Stange 3. sw nw ne 16-21s-7w	768	3389
RUSH COUNTY—		
Westgate-Greenland, Hagerman 1, ne ne ne 20-19s-16w	*	4030
RUSSELL COUNTY—		
Empire, Strecker "C" 1, ne nw sw 36-14s-14w (pb 2951)	362	3153
Hartman & Blair, Harbaugh 6, ne nw sw 25-14s-15w (pb 3170)	1660	3176
Carter, Detrick 6, sw sw se 8-15s-13w	1395	3207
W. I. Southern, Chester Sellens 2, ne ne nw 29-15s-13w	967	3309
Coralena, H. Sellens 2, se nw nw 30-15s-13w	2520	3320
W. I. Southern, Boomhauer "A" 10, nw nw ne 30-15s-13w	2647	3208
Sinclair Prairie, H. J. Sellens 4, se nw nw 36-15s-13w	713	3375
Shell, Balt 1, se se se 35-15s-14w	1276	3320
SEDGWICK COUNTY—		
Homestake Oil, McCormick 1, sw sw nw 23-25s-3w	*	4150
Shawver, Furman 1, sw ne se 24-29s-3w	*	4153
STAFFORD COUNTY—		
Empire, Benton 3, cnl ne se sw 23-24s-13w	*	4133
SUMNER COUNTY—		
Stalbar, Frankum 6, nw ne ne 32-31s-1w	186	3711
WOODSON COUNTY—		
B. & B. Oil Co., Cockery 2, ne nw nw 29-25s-14e	80	1415

*Failures; †Junked; ¶Million cu. ft. gas.

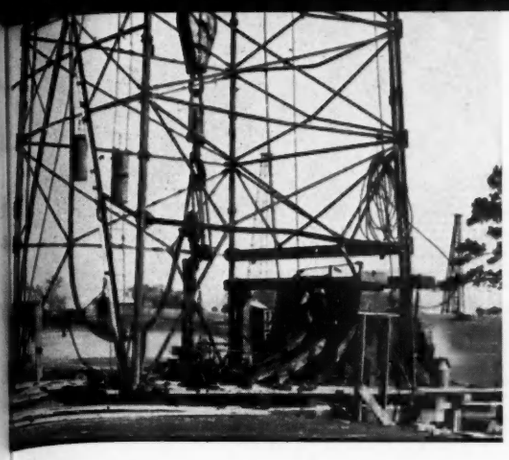
Wichita.—Possible opening of another gas pool for Sedgwick County was the prospect at Frank Hudson et al's Fulton 1, NEc SE 35-28s-1e, 9 miles southeast of Wichita. Two and one-half miles west of a well which blew in as a gasser recently from 2229 feet in the Stalnaker sand, Fulton 1 is getting a good show at the shallow depth of 750 feet. Apparently it is coming from a sand in the Admire shale. Casing will be run to bottom before drilling ahead. Geologists were checking samples from the hole to determine the producing formation.

Sinclair Prairie Oil Company's Herrick 3, SE SW SE 15-34s-2e, extended the Herrick pool of Sumner County one location south, producing from 3446 feet in the Mississippi lime. First show of oil was in the Bartlesville sand at 3418 feet, where it made 31 barrels of oil per hour during a 24-hour test period. Deepened to 3446 feet, the well had an increase in both oil and gas and flowed 44 barrels of oil the first hour and 40 barrels the second hour.

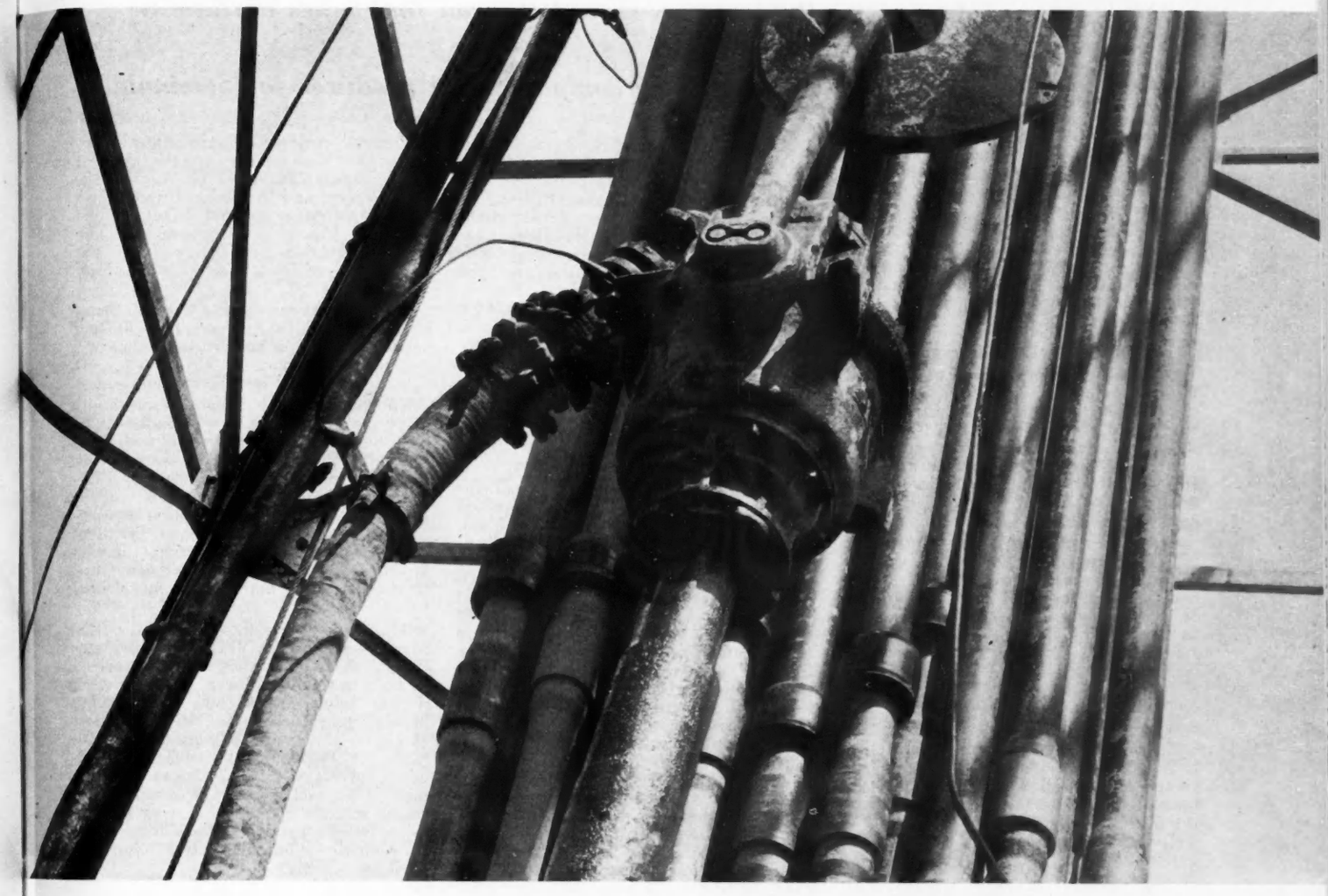
Production in the north extension of the Saxman pool of Rice County was pushed north into the next township. Continental Oil Company's Groth 1, SWc SE SW 32-20s-7w, north offset to the discovery producer in the Oden extension, was at 3337 feet in conglomerate with an undetermined amount of oil in the hole. It was being tested.

East offset to the discovery producer in the Barton County extension of the Trapp pool, Tom Johnson et al's Henry Bitter Jr. 1, NWc SW 8-16s-13w, found showings of oil in bottom hole cuttings from the Siliceous lime below 3360 feet, top of the formation. Casing was to be run before drilling in. It was about 14 inches in the lime. The extension area is 1½ miles south of the Trapp pool itself.

Oil men continue testing the extreme western border of the state, with the latest and most interesting test due to get under way late last week. It is Wilcox Oil & Gas Company's Parker Ranch 1, SEc NE 9-11s-40w, 15 miles north of Sharon Springs in Wallace County. Scheduled to go to 6000 feet, or to the Siliceous lime, expected around 5000 feet, the test is located on a major feature known as the Las Animas anticline, which has its origin in Las Animas County, Colorado. It is thought the structure continues in a northeast direction, ultimately joining the Barton Arch in the vicinity of



HIGH PRESSURES



High pressures...7,000 pounds... 8,000...even 9,000...for that kind of service, it's good to know that HEWITT Rotary Hose is on the job, But that's the way HEWITT Rotary Hose is built—special construction for protection against severe pressures, and amazing stamina to fight off gruelling abuse. Elongation is reduced to an absolute minimum, but we have kept the flexibility we know you need. HEWITT Rotary Hose can be had with an enlarged end construction, reinforced and that's a great feature. The nipple is accommodated without sacrificing a single bit of the diameter. Features like this plus the rugged strength and longer life that are built into HEWITT Rotary Hose, make men who know the value of the best, prefer HEWITT. Brass tack figures will prove to your complete satisfaction the superiority of HEWITT Rotary Hose.

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Graham, Norton and Decatur counties, Kansas. Subsurface conditions could not be determined, as developments in the area have been confined to structures above 2000 feet.

Another pool in Stafford County appears probable. The wildcat is Kessler & Their, Inc., and I. E. Bradley & Sons' W. R. Jenkins 1, SEc NE 15-25s-12w, 6 miles south of the town of Stafford. An odor of gas was had between 2960 and 2970 feet, and the test was nearing the 3800-foot level where production from the Misener sand was had at Stanolind Oil & Gas Company's Hartnett 1, NWc SE 23-24s-11w, to the northeast. To the northwest is the St. John pool, where oil comes from Kansas City lime at an average depth of 3600 feet, 200 feet higher than the producing formation at Hartnett 1. Jenkins 1 is also 5½ miles west of the old abandoned Neola pool, in Section 15-25s-11w. It was opened in 1934 and produced from between 3920 and 3928 feet in the Mississippi chat, making more water than oil.

The other pool opener for Stafford County, completed 12 days ago, was Newman & Winemiller's Sittner 1, NEc 33-21s-12w. It made a potential of 1408 barrels of oil from the Kansas City lime at 3448 feet.

Wildcat Discouraging

Outlook continues dark at Atlantic Refining Company, Skelly Oil Company and Cities Service Oil Company's Runyon 1, SW NW NE 11-27s-13w, which was hailed as a pool opener several weeks ago. Located southeast of Iuka in Pratt County, the well was drilled to 4437 feet where it had 3500 feet of fluid in the hole, mostly water.

One mile north of production in the old Rainbow Bend pool of Cowley County, Pryor, Lockhart and Johnson's Schwantes 1, NE SE SE 16-33s-3e, was showing for a possible producer at around 3180 feet. Gas was found at 2765 feet, and at 3180 feet, Bartlesville sand, it had a show of oil. Top of the chat was found at 3193 feet and the well was shut down for orders at 3200 feet.

Texon Oil & Gas Company's Letsch 1, NWc SW 26-14s-13w, in the Letsch sector of Russell County, made a potential of 1029 barrels of oil daily from the Kansas City lime at 2943 feet. The well was acidized with a total of 13,000 gallons during the week. Top of the lime was at 2919 feet. During the first four hours of a pumping test the well made 171 barrels of oil. In the next four hours it made 199 barrels.

Stanolind Oil & Gas Company's Kowalsky 2, NEc 11-20s-11w, was completed last week for 2170 barrels of oil, extending the Kowalsky pool, Barton County, two locations south.

Stanolind Oil & Gas Company, Amerada Petroleum Corporation and Simpson Oil Company's Belt 1, SW NE SW 13-20s-16w, just northeast of the Pawnee Rock pool in Pawnee County, was to run tubing and standardize before testing a good show of saturation had in the Siliceous lime at 3764 to 3775 feet.

Atlantic Refining Company's Dague 2, CSE NW 14-20s-33w, quarter-mile east extension well in the Shallow Water pool of Scott County, western Kansas, was swabbing 20 barrels of oil per hour from the Mississippi lime at 4644 feet.

NORTH AND WEST TEXAS

Wildcat may extend Duggan four miles northwest.

★ ★ ★

Ohio Oil may complete third producer for Seminole.

Midland. — Wildcats and semi-wildcats in the northern portion of the Permian basin continue to occupy the spotlight in West Texas drilling, as interest centers largely on development under way in Cochran, Hockley, Yoakum, Terry, Gaines, Dawson, and some other adjacent counties lying just east of the Texas-New Mexico state line.

Commanding particular attention lately have been a well seeking to extend the Duggan field, Cochran County, most northerly producing area of the Permian basin, a test that promises to become the third oil well of the Seminole pool, Gaines County, and various important wildcats.

Duggan Extension Looms

The prospective extension well for Duggan still had not been completed late last week, but was bein tested, following treatment first with 1500 gallons of acid and later with 3000 gallons. This well, Wiggins & Hyde's Dean-Slaughter 1, located 4 miles northwest of Duggan production, had 3000 feet of fluid in the hole after the first acid treatment. Previously the well had filled 1500 feet with 27 gravity oil from porous lime at 5004-5025 feet, and the hole was deepened to 5033 feet before treated with acid.

This well indicates important possibilities for the Duggan field, as it encountered the oil zone 51 feet higher structurally than the discovery well.

Still farther northwest of Duggan pool, about 8 miles beyond the above mentioned Wiggins & Hyde extension test, The Texas Company is drilling at 4765 feet in Slaughter 1, Cochran County wildcat on a 7000-acre block. It had a rainbow show at 4731 feet and a slight gas show at 4740 feet. The location is in League 130, Carson County School Lands Survey.

It is reported that Harris & Anderson plan to drill a test in this district of Cochran County, on the Della Slaughter Wright land, League 96, Mills County School Land Survey, about 6 miles northwest of Wiggins & Hyde's Dean-Slaughter 1.

Third Seminole Well

The well that promises to become the third producer of the Seminole field, Gaines County, is Ohio Oil Company's Averitt 1, west offset to the discovery well. Last week it was waiting on cement to set after 7-inch casing had been cemented around 4910 feet. The Seminole pool yields 33-35 gravity oil from Permian lime at 5010 to 5032 feet. The discovery well was drilled by Amerada Petroleum Corporation and associates on the Averitt land, Section 228, Block G, W. T. Railway Survey, and the only other well so far completed is an east offset, drilled by Shell Petroleum Corporation. The small allowable production from the field is moved by truck to Hobbs, New Mexico.

A wildcat about 4 miles east of Seminole, R. H. Gill's Simpson 1, is drilling below 4800 feet in anhydrite and lime.

Wasson Field Extended

Efforts to extend the productive limits of Wasson field, Gaines-Yoakum Counties, continue to be rewarded with success, although the new wells are proving relatively small producers usually. Phillips Petroleum Company's Brand 1, about 1½ miles northwest of Wasson production, is considered capable of yielding small commercial production, having swabbed oil and sulphur water after acid treatment of the lime, which was drilled to 5031 feet.

The Texas Company's Walker 1, northwest outpost of the Yoakum County section of the Wasson field, also is expected to make a small producer. Late last week it was being cleared out, after having been plugged back from 5180 to 5162 feet and then shot with 200 quarts at 5010-5095 feet. Previously, the well had yielded 36 barrels of oil in 24 hours by swabbing. This well is about 3½ miles west of the recently completed flowing producer of Denver Producing & Refining Company on the Whittenburg tract, Southern Yoakum County.

Pumper for Albaugh Area

E. L. Wilson and Associates have rigged up to pump Scanlan 1, prospective producer 4 miles west of the one well Albaugh pool, Dawson County. The Wilson well recently swabbed around 10 barrels oil an hour after acid treatment, having been plugged back from 4965 to 4933 feet.

Analysis of crude oil from Ordovician area

Crude oil produced from Ordovician lime in the Sand Hills field in western Crane County, Texas, is a wax-bearing paraffin-intermediate base oil having a gravity of 44.7° A.P.I. and a sulphur content of 0.22 percent, according to a laboratory analysis made by the United States Bureau of Mines on a sample

obtained from Gulf Oil Corporation's Waddell 4, Section 4, Block 27.

A distillation summary indicates approximately 35 percent of gasoline and naphtha, 20 percent of kerosene distillate, and 25 percent of gas-oil and heavier distillate suitable for cracking.

The analysis of this oil compares favorably with previous analyses made by the Bureau of Mines on oil produced from the heavy-oil zone of the Ordovician strata in the Big Lake field, Reagan County, Texas.

Sand Hills field is the second field to produce from the Ordovician strata in the West Texas Permian Basin—the first being Big Lake in Reagan County.

Wilbarger test promises Lower Canyon oil production

Wichita Falls, Texas.—The active campaign of drilling that is in progress in North Texas resulted last week in completion of 43 wells, of which 23 were productive and 20 were dry holes.

Development is under way throughout the area, and the past week's completions included wells in 9 counties, as follows: Archer, Clay, Cooke, Jack, Montague, Throckmorton, Wichita, Wilbarger, and Young.

Young furnished the largest number of new wells, among these various counties, with a total of 10, while Cooke and Jack counties followed with 8 and 7 completions, respectively.

A production test is still pending at the Phillips Petroleum Company deep test in the Rock River Crossing area, Wilbarger County, following cementing of pipe. Having logged favorable oil saturation at 3554-3564 feet, the well, Waggoner Estate 1-KKK, SE NW SE H&TC Section 43, Block 4, promises to yield oil from the lower Canyon lime. The well is southeast of the 3100-foot Canyon production.

Samuel S. Alexander Oil Corporation is drilling at 4000 feet in black lime in W. R. Goldston 2, north half TE&L Survey 2047, Young County, a 4100-foot test 3 miles northeast of Graham. The well is southeast of Goldston 1, which, according to the operator, had showings of oil and gas. If the present test does not obtain production in the lime, it will be tested in the saturated sand section found from 3200 to 3251 feet, where an oil show was reported.

TEXAS PANHANDLE

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARSON COUNTY—		
United Crude Oil, Cooper 3-A	763	3195
GRAY COUNTY—		
Cities Service, Hoerner 1, pb to 2885 ft	¶7	3254
Dye et al, Holmes 5	599	3284
Kewanee O&G Co., Morgan 13	794	3280
King Oil Co., Baer 2-C	452	3288
Sinclair-Prairie, Albert Combs 1	388	3007
Leycomb 9	220	2940
HUTCHINSON COUNTY—		
Phillips Pet. Co., Thompson 2	398	3252
S & M Oil Co., Moore-Langdon 7	450	3115
Stanolind, Haile A-5	243	3083
MOORE COUNTY—		
Canadian River Gas Co., Bivins A-21	¶54	3485
Continental, J. E. Wells 1	¶81	3060
Shamrock O&G Corp., J. T. Sneed Jr 7	¶20	3174

*Failures; †Junked; ¶Million cu. ft. gas.

Panhandle activity includes extensive wildcat drilling

Pampa, Texas.—Extensive drilling continues in the Texas Panhandle, as operators seek new production of both oil and gas, to satisfy the markets built up over recent years through installation of important pipe line outlets.

Completions last week numbered 13 wells, of which 9 yielded oil and 4 gas; and Carson, Gray, Hutchinson and Moore counties were represented among these completions.

Meanwhile, locations were made for 6 new wells, 1 each in Carson, Gray, Moore and Wheeler counties, and 2 in Hutchinson.

The Panhandle has under way considerable drilling of wildcats and semi-wildcats, as well as the regular field development.

In Collingsworth County M. E. Oil Company's Grogan 1, Section 100, Block 22, is drilling at 2125 feet, and

NORTH TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ARCHER COUNTY—		
Groves & Kelleher, S. E. Oldham 8-A	15	1382
Van Wormer-LeLee & Duncan, W. M. Justice 1	30	863
CLAY COUNTY—		
Metzner & Burns, J. J. Taylor 7	*	394
J. J. Taylor 8	*	520
J. J. Taylor 9	*	390
Sussex Oil Co., J. Shumake 5	*	1470
COOKE COUNTY—		
Kingery Bros., F. J. Trubenbach 1	2	921
F. W. Merrick, Inc., Nat Piott 1	2	720
Stelzer 6-C	8	848
Geo. L. Pace, R. E. Aldridge 10	100	1085
Schermerhorn Oil Corp., M. Kessler 10	72	1310
Trumter Oil Co., Andress Bros. 9	57	768
Whitfield et al, F. C. Owens 7	*	2967
Witherspoon Oil Corp., F. L. Luke 1	*	850
JACK COUNTY—		
R. D. Compton Oil Co., Tom Craig 1	*	386
C. C. Henderson 13	*	328
W. H. Hammon & Hanlon-Buchanon, D. J. Hodges 1	50	3026
Hanlon-Buchanon, Inc., J. C. Lindsey 1	*	3620
F. H. Rhodes 1	23	2391
Mullendore, Berry & Berry, R. R. Clayton 3-B	395	3040
Peery & Woody, J. A. Raley 8-B	580	2944
MONTAGUE COUNTY—		
Montague Oil Corp., W. T. Ball 2	*	4472
Sinclair-Prairie, Viola Holt 3	30	1802
Texas Northern Oil Co., L. Keck 1	20	836
THROCKMORTON CONUTY—		
Canyon O&G Co., E. M. Marrs 1	*	550
WICHITA COUNTY—		
Boardman Bros., J. L. Jackson 5	*	700
G. A. Hunter, Waggoner Bros. 1-A	5	661
Melat & Graham, Munger Bros. 2-B, after shot	1032	3870
Perkins & Snyder, Jno. Serrien 11	10	1673
Luther Webb et al, A. J. Schultz 1-A	*	1973
WILBARGER COUNTY—		
Hamilton Pet. Co., R. L. Castleberry 2	*	2358
King Oil Co., Waggoner Est. 8-F	5	1884
Waggoner Ref. Co., Waggoner Est. 5-B	624	3078
YOUNG COUNTY—		
Cable Oil Co., S. E. Snyder 37	*	618
H. J. Cox, W. T. Donnell 1	*	1800
B. C. Gilmore, Josie Williams 3	*	627
C. E. Knox, W. P. Stephens 1	28	4247
Rathke Oil Co., C. E. Graham 1-B	*	884
Geo. Terrell, R. J. Routan 1	*	775
R. H. Vise, Norton Prop. 3	720	3750
R. J. Watson, Belknap Coal Co. 1	5	710
D. L. Wolfe, J. W. Wilson 3	*	1111
Henry Zweifel, W. Bufford 1	400	2620

*Failures; †Junked; ¶Million cu. ft. gas.

Wischkaemper's Fee 1, Section 58, Block 16, is shut down at 2264 feet.

The Dallam County wildcat, H. E. Seward's Wynne 1, Section 26, Block 47½, recently was reported drilling below 900 feet.

The Deaf Smith County deep test, Western Union Oil Company's Farwell 1, Section 18-3n-2e, is drilling at 5396 feet.

[*Continued on page 70*]

WEST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANDREWS COUNTY (Means)—		
Humble, J. S. Means 28, Sec. 9, Blk A-35, PSL Sur	342	4522
CROCKETT COUNTY (World)—		
Eppenauer Drlg. Co., Powell 1-E, Sec 53, Blk BB, GC&SF sur	287	2645
ECTOR COUNTY (Foster)—		
Amon G. Carter, Johnson 5, Sec. 12, Blk. 43, T-2-S, T&P sur, flowed	792	4200
Stanolind, Wichter 2, Sec. 24, Blk. 43, T-2-S, T&P sur	918	4190
ECTOR COUNTY (Goldsmith)—		
Atlantic, Cummins 3-E, Sec. 34, Blk. 45, Twp 1n, T&P sur	165	4250
Continental, Rumsey B-35-3, Sec. 35, Blk. 45, Twp 1n, T&P sur	283	4285
W. H. Dunning, Jr., C. Scharbauer 8, Sec. 33 Blk. 44, Twp 1n, T&P sur	1224	4227
Landreth Prod. Corp., Cummins 3-B, Sec. 24, Blk. 45, Twp 1n, T&P sur	309	4227
Scharbauer 4-E, Sec. 19, Blk. 44, Twp 1n, T&P sur	1491	4210
Scharbauer 6-D, Sec. 32, Blk. 44, Twp 1n, T&P sur	2572	4230
Scharbauer 8-B, sec 33, Blk. 44, Twp 1n, T&P sur	3026	4188
ECTOR COUNTY (Harper)—		
Honolulu & Black, E. F. Cowden 2-B	320	4310
HOWARD COUNTY—		
Eastland Oil Co., Snyder 1, Sec. 27, Blk. 30, T-1-S, T&P sur, pumped	451	2960
Moore Bros., J. B. Harding 1, Sec. 19, Blk. 33, T-1-S, T&P sur	213	3517
PECOS COUNTY (Toborg)—		
Cardinal Oil Co., Smith 15-A, Sec. 41, Blk. 194, GC&SF sur, pumped	18	355
UPTON COUNTY (McCamey)—		
Atlantic, Shirk 5, Sec. 1, Blk. 1, MK&T sur	452	2510
Choate & Hogan, Baker 3, Sec. 7, Blk. R., M. S. Denton sur, pumped	948	2381
Homestead O&G Co., B. W. Owens 1, Sec. 91, Blk. Y, CCSD&RGNG sur, pumped	136	2381
Richardson Oils, Harrell 1, Sec. 11, Blk. R, TC Rr. sur	236	2158
Glenn J. Smith, Burleson 3, Sec. 4, Blk. R, GC&SF sur	747	2165
Snowden & McSweeney, Hughes 8, Sec. 4, Wm. Teer sur, pumped	317	2413
WARD COUNTY—		
Black & Hedrick, Snelson, 3, Sec. 6, Blk. 32, H&TC sur	49	2229
Gulf, O'Brien 16, owdd, Sec. 17, Blk. F, G&MMB&A sur	33	2760
Humble, University 16-F, Sec 2, Blk. 16, University sur	888	2751
T. & P. Coal & Oil, Barker 10, sec. 27, Blk. B-29, PSL sur	379	2407
WINKLER COUNTY (Emperor)—		
Bert Fields, Cowden-Pure 2-A, Sec. 26, Blk. B-5, PSL sur, flowed	1900	3000
WINKLER COUNTY (Henderson)—		
Champlin & Bass, Hess 9, Sec. 4, Blk. 26, PSL sur	1537	3075
Emperor Oil Co., Hess 5, Sec. 4, Blk. 26, PSL sur	973	3070
WINKLER COUNTY (Kermit)—		
Harry Adams et al, Walton 10-A, Sec 26, Blk. 26, PSL sur, flowed	1487	3084
Gulf, O. Clapp 15, Sec 26, Blk 26, PSL sur, flowed	1206	3113
Humble, Colby 23-A, Sec. 25, Blk. 26, PSL sur, flowed	958	3110
Illinois Oil Co., Central State Bank of Abilene 13-A, Sec. 23, Blk. 26, PSL sur, flowed	1265	3090
J. C. Maxwell, Cartex 5, Sec. 23, Blk. 26, PSL sur, flowed	1993	3090
Sinclair-Prairie, Vaden 3-B, Sec. 35, Blk. 26, PSL sur, flowed	417	3065
T. P. Coal & Oil Co., Frank Vaden 1, Sec. 35, Blk. 26, PSL sur, flowed	193	3051
WINKLER COUNTY (Scarborough)—		
Illinois Oil Co., Scharbauer 1-E, Sec. 2, Blk. 77, PSL sur, pb to 3131 ft	5	3410

*Failures; †Junked; ¶Million cu. ft. gas.

Marginal law makes cutting big field a problem.

* * *

Slight reduction in volume of drilling activity.

Kilgore, Texas.—Although it is almost 7 years old and densely drilled, East Texas, the world's largest oil field, still is at the top in drilling activity.

Within the big field, 86 rigs are in operation, a decrease of half a dozen having occurred in the number of active operations in the past few weeks.

The slight decline in field work lately may have resulted from uncertainty over whether or not the field allowable production will be reduced under the October proration schedule. It has been indicated that such a reduction may be ordered by the Texas Railroad Commission.

During the past week 51 new wells were completed, compared with 57 the week before. Last week's completions were all oil producers. They included 15 in the Joiner section of the field, 16 in Kilgore area, and 20 in the Longview division.

Compensating for the wells that were completed within the past week, locations were made for 54.

Early last week the East Texas field had an allowable production of 477,398 barrels daily from 23,502 wells.

These wells are spread out over a total productive area of approximately 132,000 acres, indicating that the field has been drilled so far to an average density of 1 well to 5.6 acres.

The East Texas field wells are allowed to produce each day 2.32 percent of their hourly potentials, this proration factor having been employed for an extended period. However, under that factor, 17,767 wells out of a total of 23,502 in the field would have allowables under 20 barrels a day each, and consequently are classed as marginal wells and are given the flat allowable of 20 barrels daily, since Texas law specifies that wells of the 3000-4000-foot depths may not be prorated under 20 barrels a day.

The Texas Railroad Commission formerly allowed the East Texas wells to produce a higher percentage of their potentials, but as new wells were completed the field allowable climbed, and the commission repeatedly cut back the percentage of potential factor.

6000 Above Minimum

Under the present factor, less than 6000 wells are good enough to earn more than the 20-barrel daily quota of the poorest wells in the field, and if the factor should be further reduced, a still smaller number of wells would be above the marginal well class.

Thus the field is very near to the stage calling for the flat 20-barrel allowable for every well in the field.

However, under the law and the intimations of courts, the East Texas proration may not be legally valid unless the commission assures better wells larger allowables than poor wells.

The East Texas proration finally has reached a critical stage, for engineers report that the pressures in the field are seriously declining, indicating that the field allowable should be cut back from the present total of around 477,500 barrels daily.

If the proration factor is not reduced, the field allowable will continue to increase, and the dissipation of pressures presumably will be continued.

Yet even if the proration factor is reduced, the field allowable will not be materially lowered, as additional wells will automatically be thrown into the marginal well class, and their allowables will be cut back only from a little over 20 barrels daily to exactly 20 barrels daily; while the relatively few above-marginal wells that will remain can be reduced but little in allowables, as even under the present factor the better wells do not rate much above 20 barrels allowable daily.

Even if the proration factor should be made so low that every well in the field would have a daily allowable under 20 barrels, the field allowable still could not be reduced materially, for then all those wells would have the marginal allowable of 20 barrels per day, and for the 23,500 wells in the field the total allowable would be 470,000 barrels daily.

Presents Problem

If the 20-barrel daily marginal allowable is to be preserved, it is obvious that the field allowable cannot be reduced much further. Similarly, it is indicated that no relief is in sight for the declining pressures, since it is not clear how the field allowable could be reduced, under the present law.

If the railroad commission should attempt to waive the 20-barrel marginal well quotas and apply the proration factors to all wells, making the allowables of many of them less than 20 barrels a day each, it is quite possible that the commission's authority for such action would be tested in the courts.

But in putting all of the wells on practically the same footing, as it is doing now, the commission also runs the risk of being dragged into the courts, since previous litigation has brought from a federal court the intimation that the East Texas proration is valid only in so far as it assures better wells higher allowables than the poor wells.

Probably the saving situation is the fact most of the East Texas operators realize they are in the same boat of proration, which at least is keeping everybody dry, and that if anyone gets up and challenges the railroad commission's seamanship, the boat may be overturned, and not only the commission but also everybody else aboard may be thrown suddenly into dangerous waters.

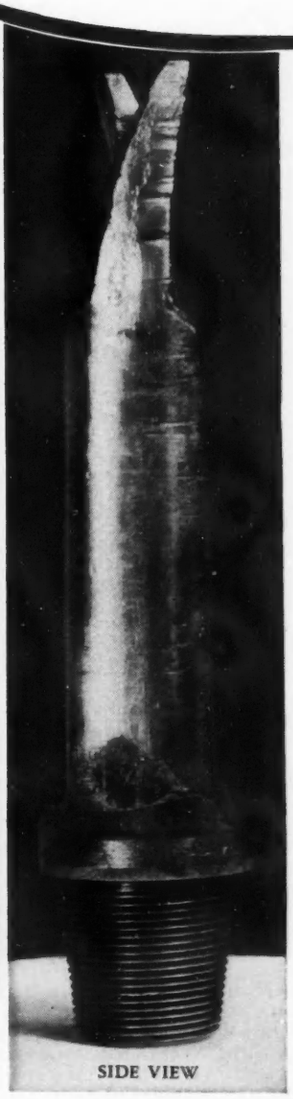
EAST TEXAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
Arcadia Ref. Co., J. R. Green 17 (55.56-ac)	3600	3740
Arkansas Fuel Oil Co., Wheelis 18 (80.72-ac)	3800	3684
Atlantic, Ida Kinney 45 (335-ac)	1500	3620
Blackwell O&G Co., S. Stone 7-B (32.1-ac)	5600	3656
Everts Drlg. Co., Frank Cole 8 (49.67-ac)	7200	3735
Gulf, H. Johnson 10 (101½-ac)	3600	3788
Humble, A. D. Blackwell 54 (325.79-ac)	8000	3663
C. J. Thompson 27 (116-ac)	6500	3687
Jackson-Wise-Sneddon, J. B. Wilson 9 (41-ac)	9000	3615
Martex Oils, Inc., Mayfield 43 (197.1-ac)	3500	3744
Ohio, M. M. Cross 84 (814.54-ac)	4800	3638
Stanolind, J. B. Milstead 17 (84.22-ac)	3500	3682
Texas Co., A. S. Jarvis 11-B (116½-ac)	1200	3666
Texas Gulf Pet. Co., Hodnett-Melton 20 (134.84-ac)	2300	3687
Tide Water Associated, J. W. Flanagan 8 (40-ac)	7000	3665
KILGORE AREA—		
O. D. Adams et al, R. H. Still 4 (12.17-ac)	120	3579
Bennett Pet. Corp. (was F. W. O'Brien), W. Daniels 4 (20-ac)	9500	3550
Carl G. Dunham et al, J. H. Scroggins 8 (57.8-ac)	5000	3687
R. W. Fair & Thompson, D. Carr 6-B (55-ac)	4500	3478
Gulf, W. Clayton 10 (50-ac)	7200	3538
M. R. Terrell 11 (60.26-ac)	4500	3613
Hamill & Smith, M. B. Hughey 3, blk 123	1200	3565
Humble, T. Barton 9 (50½-ac)	3500	3644
Magnolia, D. Wells 14 (100-ac)	240	3709
Perot Oil Corp. (was ABCD Oil Synd.), McNeely 6 (17½-ac)	3000	3640
J. C. Prine-Fensland Oil Co., P. C. Warren 1-A (22-ac)	100	3777
T. S. Schroeder et al, A. A. King 3-B (10-ac)	180	3480
Stidham & Thrasher, Fred Birdsong 1 (5/100-ac)	7200	3640
Tide Water Associated, E. R. D. Bivens 33 (202.7-ac)	8800	3638
W. C. Turnbow Pet. Co., A. Clary 5 (22½-ac)	125	3551
Mrs. R. H. Vise et al, C. Wells 7 (17.9-ac)	3600	3658
LONGVIEW AREA—		
Amerada, S. H. Killingsworth 15 (100-ac)	8800	3619
Atlantic, J. C. Judge 86-A (455-ac)	10,500	3640
J. M. Moore 78 (447¼-ac)	11,000	3602
Atlantic-Sun, Barnswell 10-B (50-ac)	8000	3510
Deep Rock Oil Corp., B. Jones 18 (60-ac)	9600	3655
Gen'l American Oil Co., A. J. Sanders 19-A (73.6-ac)	4000	3585
T. Wells 13 (91.4-ac)	3500	3693
Gen'l Crude Oil Co., Barnswell 11 (50-ac)	9000	3488
Great Plains O&G Co., B. C. Christian 6 (24-ac)	9600	3640
Gulf, S. C. Fishburn 29 (200-ac)	8500	3495
Humble, A. Carter 16 (90.2-ac)	9000	3610
A. Carter 17 (90.2-ac)	8500	3618
J. T. Miller 13-B (99.35-ac)	3000	3680
J. T. Miller 14-B (99.35-ac)	3500	3699
Rudco O&G Co., Nicholson 6 (113½-ac)	1000	3651

[*Continued on page 70*]

One Haystellited Bit *drills 2000-foot Well*

FRONT VIEW



SIDE VIEW

IN a Texas oil field, this 9⅞-inch Haystellited bit recently drilled a 2000-foot well. Yet the bit is still almost as good as new. Before Haystellite was used, 4 to 6 bits were required to drill a well of the same depth in this field.

This and many similar records indicate why bits hard-set with Haystellite Inserts and hard-faced with Tube Haystellite are so widely used all over the world. Results are dependable because these products are of uniformly high quality.

"Haynes Stellite Products in the Oil Fields", a 36-page book, explains when and how to use Haystellite Inserts, Haystellite Composite Rod and Tube Haystellite for best results. Write for a copy today.

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Haynes Stellite Welding Rods and information on other Haynes Stellite Products also are available through the 46 apparatus shipping points of The Linde Air Products Company

[*Continued from page 68*]

Company, Well and Location	Init. Prod. Bbls.	Depth
Shell, W. T. Burnsides 27 (160-ac)	9600	3525
Sklar Oil Corp.-Joe Zeppa, Tr., O. Victory 7 (44.14-ac)	5000	3653
Stanolind-Falcon Co., J. C. Newman 1 (19.82-ac)	3000	3639
Stanolind-Tide Water, J. F. Willhite 7 (29.78-ac)	9000	3704
Angus Wynne et al, E. Carter 1 (3.24-ac)	8000	3630
ANDERSON COUNTY (Cayuga)—		
F. H. E. Oil Co., C. Morrow 1, J. Madden sur	2000	5372
Hunt Oil Co., C. L. Smith 1, J. Adams sur	2500	5260
ANGELINA COUNTY (Wildcat)—		
Plaza Oil Co. (was Ginther & Vant Hull) Cope Hrs. 2, Jose Morin sur, 3 mi e Diboll, pb to 2200 ft..	*	2690
ANGELINA COUNTY (Huntington)—		
Dr. H. M. Wilson, Willroy 2, B. A. Jones sur, top sand 1435 ft, pumping	5	1460
CHEROKEE COUNTY (Wildcat)—		
A. C. Bierman et al, L. J. Strong 1, F. J. Anthony sur, 1 mi nw Mixon, top water sand 4392 ft, quit in sandy shale	*	4496
FRANKLIN COUNTY (Talco)—		
L. S. Flannery, J. Heydrick 5, pumping	432	4296
Grey & Wolfe, Bolin 1-A, pumping	323	4307
Humble, Leake 2, pumping	502	4302
Werby & Tune, Sanders 1, pumping	345	4291
FREESTONE COUNTY (Cayuga)—		
Stanolind, Cullinan 2	2500	4027
HENDERSON COUNTY (Cayuga)—		
Allison Prod. Co., B. Wathen 5 (was 4), R. H. Parson sur	2000	4100
Sun, Watkins 3, J. Hollien sur	84	4116
TITUS COUNTY (Talco)—		
Cable Tool Drilling Co., Edwards 2, pumped	205	4310
Housh-Thompson, Moore Gro. Co. 4, pumped	432	4300
Humble, Batson 3, pumped	464	4322
Davis 5, pumped	464	4323
R. E. Moore, Tr., R. S. Helton 1-A, pumped	550	4320
O'Neal & Rotundi, R. S. Helton 1-A, pumped	30	4345
Scott Bros., Edwards 1-B, pumped..	260	4303
VAN ZANDT COUNTY (Van)—		
Armmons et al, Brannon 1	*	300
Spratt Oil Co., P. L. McNeill 1, 4 mi n Ben Wheeler, w Van	*	684
CASS COUNTY (Rodessa)—		
Bay Oil Co., Cobb 2, J. Crowder sur	110	6097
W. B. Parker 2, G. Crowder sur	70	6040
United Gas, Allday 4, Priscilla Evans sur	130	6020
Starcke A-2, D. Gilliam sur	150	6040
MARION COUNTY (Rodessa)—		
Mid-Continent Pet. Co., Sory 2, A. de los Santos Coy sur	288	6108

*Failures; †Junked; ¶Million cu. ft. gas.

Panhandle Activity

[*Continued from page 67*]

In Hansford County, Texas Mineral Investment Company's Norton 1, Section 123, Block 2, has reached 2860 feet.

A rig has been moved to the site of the Hartley County test, Canadian River Oil Company's Bivins 22-A, Section 13, Block 2.

The Ochiltree County test, J. R. Macon's Norris 1, Section 212, Block 43, is drilling below 4633 feet.

In Roberts County the Chicken Creek Oil Company's Ledrick 1, Section 55, Block C, is shut down at 6590 feet, and Whitlock et al's Cunningham 1, Section 74, Block M-2, has pipe stuck at 2350 feet.

The extensive development in Gray County embraces various interesting tests. Moran Brothers' Osborne 1, Section 108, Block 3, is drilling at 1900 feet. Ochiltree Company's Saunders 1, Section 64, Block 3, was swabbing after shooting at 3148-3225 feet. Salisbury Oil Company's Yoder 1, Section 116, Block 3, was building derrick. W. H. Taylor's Taylor 1-B, Section 24, Block B-2, was drilling at 2075 feet.

Agua Dulce steps to fore as important oil reserve.

* * *

Linking of Keeran and Placedo fields appears nearer.

* * *

Texaco gets salt water in Ganado extension attempt.

Corpus Christi.—Agua Dulce district, Nueces County, comes to the fore as a highly important reserve for South Texas Gulf Coast as a series of deep tests indicate a number of producing zones in the Frio and Vicksburg sands. The trend, some 15 miles long, northeast to southwest, and several miles wide, has six wildcats active to sands ranging from 6000 to 8500 feet.

Camp Production Company's C. P. Wardner Trustee 1-A, more than a mile southwest of the nearest producer in Stratton field, Nueces County, cored sand with spots of shale at 6273-81 feet and good sand at 6281-92 feet, a drill stem test of the entire section recovering 375 pounds pressure, 100 feet of gasoline and a little mud in 5 minutes through ¼ and ⅜-inch chokes. The well has had several sands showing gas and distillate, and is drilling deeper to test zones productive in Agua Dulce field.

Gets New Frio Sand

The above well, in the northwest part of Section 18, and 900 feet north of the Kleberg line, indicates new Frio sand for the field (already productive at 4750 feet) at 6000 feet. There are three producers in the field besides the drilling well, all being spread over a trend 8600 feet long and across the center of the Camp 8600-acre block. These wells have high gas/oil ratios, as is the case of practically all other production along the Agua Dulce trend.

There are three natural gasoline plants in operation in the district, and it is likely that further construction of this type will be started soon to handle production as developed.

Top of the Vicksburg is encountered around 7000 feet and several good sand sections have been encountered in wells thus far drilled. One test found more than 60 feet of solid sand just above 7300 feet, the section showing both oil and gas, but completion being prevented due to mechanical difficulties.

Another very important test in the county, however, failed to materialize, being abandoned in the Frio at 7269 feet. It is Sam E. Wilson Jr.'s J. F. Herold 1, on the Bohemian Colony prospect.

Perforating at Lamar

Barnsdall Oil Corporation is preparing to complete Kate Edwards 1-A at Lamar Townsite, to open Aransas County's second field below 7000 feet. The well originally drilled to 9785 feet, plugged back and perforated at 7502-30 feet, where a 40-minute drill stem test developed 725 pounds gas pressure. It is being perforated again.

Over in McCampbell field, same county, Atlantic Refining Company has passed through known horizons of the field in Porterfield 1-C, Lot 8, Block 12, and is drilling ahead to 8100 feet. It was nearing 7500 feet at last reports. About 2 miles southwest of the field, and in San Patricio County, Danrey Oil Company's Jean Davis 1-A tested salt water after perforating at 7100-10 feet and is shut down for orders. It also tested salt water in all sands now productive in the field.

May Connect Two Fields

Connection of production in Keeran and Placedo fields, Victoria County, appears nearer with Stanolind Oil & Gas Company's Henderson & Pickering 1, a mile northeast of Placedo, developing considerable gas pressure on drill stem test at 4774-93 feet, the regular Heterostegina sand producing in the field. It is now coring for the sands below 5200 feet productive in both areas.

Still farther northeast and an outpost of Keeran field, Union Oil Company of California's Keeran 6 is rated at 20 to 25 barrels per hour through ¼-inch choke from a new sand. The horizon, logged at 5598-5613 feet, was found in several other wells, but none attempted completion.

A multiple well program for the northern portion of Heyser field, Calhoun County, appears nearer following the uncovering of the third Frio sand by Normandie Oil Company's J. G. Cook 3. The new well had a very high gas/oil ratio in the regular pay after casing was perforated at 5483-90 feet, so the holes were squeezed and new perforations made at 5538½-68 feet and 5583½-93 feet, the result being a flow of 29 barrels per hour through ⅜-inch choke under working pressure of 350 pounds on tubing. There is another sand in the northern portion of the field just below 5700 feet.

The Texas Company encountered salt water in Frio sand to 6543 feet and has abandoned C. E. Niebuhr 1, 1¼ miles northwest of Ganado field, Jackson County.

SOUTH TEXAS
Completions

MIRANDO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
DUVAL COUNTY—		
Cox & Hamon, Greene 24, BS&F sur (Hoffman)	145	2729
Duval Oil Corp., W. K. Hoffman 9-A, sur 118, (Hoffman), (perf 2688-2708)	¶4	2816
Gravis & Doran, F. Vaello Puig 5, San Andres grant (N. Sweden)	300	4799
John H. Hougen, Tr., W. H. Patton Tr. 1, sur 148	*	3005
Magnolia, Duval County Ranch 6, sur 203 (Piedre Lumbre)	210	2007
Penn-Palangana Oil Co. et al, Gravis 1, sec 254	†	6165
Reynosa Oil Co., F. G. Wilson 3, Sweden subd, Santos Flores grant, (N. Sweden)	450	4799
Standard of Kansas, Lillian Parr 7, San Andres grant (N. Sweden)	475	4750
Walstad 4, Sweden subd, Santos Flores grant (N. Sweden)	380	4788
G. Stratton and Baltimore Drlg. Co., W. F. Afflerbach 1, sur 342	*	1210
McMULLEN COUNTY—		
Humble, Atkinson 2, M. J. Deem sur Loma (Alta)	*	2217
E. M. Jones, Ezzell 18, Ezzell Ranch subd, H. Russell sur No. 11 (Ezzell)	375	1520
STARR COUNTY—		
Barnett-Porter & Brown, Miguel Valdez 1, 12.23-ac tr, por 84 and 55	*	2006
WEBB COUNTY—		
Gypsy, Martin 7, sur 458 (Oilton)	425	1896
Martin 8, sur 458 (Oilton)	220	1926
O. W. Killam, D. G. Garcia 12, sur 786 (Killam)	150	2007
J. W. Magee, E. Garcia 1, blk 21, Henry James subd, Garcia tract, J. V. Borrego grant	*	2017
Eugene Mays, Robt. H. Dickens 2, sur 1007 (Killam)	52	1995
ZAPATA COUNTY—		
B. W. Roscoe, C. Bustamante 20, Fansler Partition, Comitas grant	25	1230
C. Bustamante 29, Fansler Partition, Comitas grant	20	1261

SAN ANTONIO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
BEXAR COUNTY—		
Dewey et al, C. A. Weeber 1, 175 ft el, 289 ft nl of 100-ac tr, Juan Montes sur, county blk 4007	*	21
CALDWELL COUNTY—		
Fred J. Adams and C. F. Richards, Flowers and Leyendecker 4, Dillard Cooper and J. A. Neill sur (Branyon)	150	2210
F. Blundell and Gem Oil Corp., Fee-Blundell 2, R. B. Jarmon sur (Branyon)	*	2385
J. C. Bretaund, W. A. Magee 1, John Neill sur (Branyon)	425	2236
S. S. Cargill, G. P. Patten 1, R. Miller sur (Branyon)	80	2083
Chisholm and Assoc., F. Lane 1, 6500 ft el, 1000 ft sl of Byrd Lockhart sur No. 8 (1 mi e Lockhart)	*	2190
Louis Crouch, A. W. Jolly 5, C. Crenshaw sur (Larremore)	35	1280
L. Moses 3, G. Hinds sur (Salt Flats)	78	2641
McNeill Pet. Co., R. M. Martindale 1, 800 ft swl, 150 ft sel of farm and Hector McNeill sur	*	1475
C. H. Mee & McNeill, H. Cosey 1, John Henry sur (Luling)	320	2157
Second National Oil Co., E. B. White 1, James Pinchback sur (Branyon)	100	2203
Stewart, Carter, Ramos, J. J. Brown 2, C. M. Cannon sur (Buchanan)	125	2185
Mrs. M. R. Tinkle, S. M. Blackwell 1, Richard Miller sur, 150 ft nel and sel of 40-ac lse, 260-ac tr	*	2180
W.M. Vaughey et al, W. Clark 3, J. R. Miller sur, (Branyon)	25	2117
DIMMITT COUNTY—		
Wilcox O&G Co., Light Ranch (Luminar) 2, 330 ft s&w lines, s sec 29	*	5915
Diamond Half Oil Co., E. Bibbs et al 2, 163 ft nel, 150 ft sel of 67.7-ac lse out of 217-ac tr, Joel D. Robinson sur	320	2516
Forest Dev. Corp., A. Krueger Est. 1 (Zoboroski)	75	2538
Kennedy & Crowley, Gus Jahns 1, 150 ft sl Guadalupe River, 150 ft wl 100-ac lse, J. K. Davis sur	*	2507
Texas Co., Anderson 8, Jacob C. Darst sur (Darst Creek)	300	2546
MEDINA COUNTY—		
F. A. Brown, Bilhartz 1, 2325 ft wl, 225 ft sl, 200-ac tr, T. Campbell sur	*	1450
R. C. Hill, W. B. Odem 3, Henry Castro sur 173-4 (Taylor)	*	625
Kelfar Oil Co., Flora H. Briscoe 1, 330 ft nl and el 173.2-ac tr, Aloys Schmidt sur No. 8	*	2523
R. J. Taylor, R. J. Taylor 1-A, 462 ft el, 942 ft nl, 657-ac lse, sur 135	5	351

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
ARANSAS COUNTY—		
Atlantic, Murray 1-C, blk 38 (McCampbell)	65	7138
BEE COUNTY—		
Al Buchanan & Blanco Oil Co., P. Perez 3-B, J. M. Uranga gr (West Tuleta)	100	3139
CALHOUN COUNTY—		
Normandie Oil Co., J. F. Cook 3, Agaton Sisneros sur (Heyser)	1750	5600
COLORADO COUNTY—		
Coyle-Concord Oil Co., South 2, 125 ft sl, 125 ft el I&GN 41	¶5 & 150	6036
JACKSON COUNTY—		
Texas Co., C. E. Niebuhr 1, 466 ft nl and wl of 100-ac tr in O. S. York sur	*	6543
LIVE OAK COUNTY—		
Unit Pet. Co., W. O. Nichols 1, 5800 ft n of Frio River, at r/a 3000 fe e, along line of Simon Ryan sur	*	1467
NUECES COUNTY—		
Houston Oil Co., T. M. Harrell 6, blk 13 (Saxet)	320	4780
Humble and Barnsdall, M. G. Graham 1, blk 41 (Flour Bluff)	800	6656
Mid-Continent O&G Co., Sevier 3, Cuadrilla Ill. Co. sur (Clara Driscoll)	260	3811
Phillips, Katherine Hutchins 7, Sheppard Farm lots 29 (Saxet)	450	6997
Richardson Pet. Co., Cain & Sechrist 22, J. C. Russell Farm Lands (Saxet)	500	4552
F. Quiroz 12, Sheppard Farm Lots, (Saxet)	175	6950
J. B. Sedwick 7, GC&SF RR sur No 311 (Saxet)	550	6947
Seaboard, Luby 2, 1520 ft el, 1400 ft sl, blk 4, sec 2, Luby Subd, Palo Alto grant, Canutillo Ditch Colony sur	600	5059
Southern Minerals Corp., Frank E. Bliss 21, J. S. Stevens sur	*	1114
Sam E. Wilson, J. F. Herold 1, 330 ft swl and sel of lot 2, sec 6, Bohemian Colony Subd, Enrigue Villareal sur	*	7268
REFUGIO COUNTY—		
L. A. Nordan, Tom O'Connor 1, James Hewitson sur (Tomoconnor-Greta)	1575	5915
SAN PATRICIO COUNTY—		
Phillips, B. E. Ivey 3, Pauls subd, sec K (Midway)	700	5360
VICTORIA COUNTY—		
Barnsdall & Felmont, Pickering & Roos 1, SA&MG sur (Placedo)	¶10	6320
Haynes B. Ownby, J. Malik 5, SA &MG sur No. 7 (Placedo)	400	4769
Union, Keeran 6, Martin de Leon Grant (Keeran)	150	5613

*Failures; †Junked; ¶Million cu. ft. gas.

Wildcat near Cedar Creek plugs back to Austin chalk

San Antonio.—Efforts to develop an Austin chalk field 2½ miles east of Cedar Creek in Bastrop County are meeting with only a fair degree of success. Hantho-Nelson, Inc.'s K. M. Litton 1, after drilling to 2517 feet, 27 feet in the Edwards limestone, has been plugged back to about 2250 feet, in the Austin chalk and will be acidized again with 4000 gallons. Previously it showed some oil in the chalk.

Two miles southwest, R. Olsen Oil Company was drilling more chalk in Mattie Murchison 1, which found saturation from 1828-1925 feet, but could not complete. It did make about eight barrels per hour for several hours before mechanical difficulties prevented regular production.

To drill 8500-foot test on large Willacy County block

Mission. — Willacy County had its number of active deep wildcats increased to three during the week when Allen and Morris started moving in materials for an 8500-foot contract for La Sal Viejo Oil Corporation. The well will be Garcia Land and Cattle Company 1, in tract 73, one mile from the west line of the tract and seven miles north of Shell Petroleum Corporation's Yturria 1, discovery well of La Sal Viejo and first in the Rio Grande Valley to drill below 10,000 feet.

The new well is being drilled on a large block from which spreads have been sold to Pure Oil Company, Barnsdall Oil Corporation, Ohio Oil Company, Pan American Production Corporation, and Continental Oil Company. La Sal Viejo Oil Corporation is headed by J. R. Dougherty, of Beeville and S. F. Burlburt of Corpus Christi.

Up in Brooks County, Standard Oil Company of Texas is completing Mestina Oil & Gas Company 2, Lease 2, in sand at 2395-2400 feet. It is 308½ feet southwest of Mestina 1, discovery well of the North Alta Mesa field, completed several weeks ago as a gasser at a shallower level.

Mirando district extensions offset by wildcat failures

Laredo.—Minor field extensions were offset by wildcat failures through the Mirando district Jackson trend during the week. North Sweden, Oilton-Killam and Ezzell had slight boosts in potential producing areas as a result of completions.

Bob Holland and Henderson Coquat's W. C. Matikin 1, ¾ mile northeast of Ezzell and in Live Oak County, looks like a 40 to 50-barrel pumper from broken sand at 1485-1502 feet. It encountered numerous mechanical difficulties, which may be responsible partially for the low production in relation to wells on the Ezzell ranch, rated at 200 to 500 barrels per day.

The above well is the first off Edwin M. Jones' Ezzell lease, and paves the way to considerable development on small tracts.

First Twin Producer for North Sweden

North Sweden, Duval County, most active area in the district, contributed its first twin producer through completion of Gravis & Doran's Vaello Puig 5, 50 feet east of Puig 4 and 760 feet east of the discovery well. The test, completed in the Gravis sand at 4790-99 feet, flowed four barrels per hour through 5/32-inch choke under pressures of 450 pounds on tubing and 400 pounds on casing. Puig 4 made 27.28 barrels in six hours through 3/16-inch choke at 4739-50 feet in the Parr or upper sand. As a result of this company's completion, more dual operations may be expected. Five different sands have been uncovered in the field but it is not likely that all will be productive under the entire field.

Several North Sweden outposts were completed in the regular sands, providing slight extensions to the already established producing zone.

Shallow Trend Wildcatting Disappoints

A rather active, but unsuccessful, wildcatting campaign is being carried

on along the shallower trend of this district. Numerous shows of oil and gas have been found in the Jackson sands, but their importance thus far has been insufficient to warrant completion attempts.

Further work along the Killam-Oilton trend in Webb County virtually assures the connection of these areas. J. B. Blanchard No. 1 Laurell Brothers, NW SW Section 1006, just south of the Oilton production, cored oil sand around 1930 feet and set casing. It looks like a slight extension.

ASME to meet during Oil-World Exposition

The Petroleum Division of the American Society of Mechanical Engineers will hold a meeting in connection with the Oil-World Exposition in Houston on the evening of October 12, 1937. The program will be under the sponsorship of the Exposition Drilling committee of which Joe Russell of Gulf Production Company is chairman.

Several papers covering the mechanical phases of the petroleum industry are now in preparation by members of the Houston Division of the American Society of Mechanical Engineers. The program is being handled by the society's committee, which consists of W. F. Herbert, The Texas Company, chairman; W. P. Preston, Texas Gulf Sulphur Company; W. W. Scott, Humble Oil & Refining Company; F. M. Leverett, Texas Company; D. D. Alton, Southern Pacific Lines; A. B. Steen, Jr., Humble Pipe Line Company and Nathan Janco, Reed Roller Bit Company.

This meeting is one of a number which will be held in connection with the Houston Oil Show. Programs for all the conferences and meetings are now well under way with many of the papers already prepared. The programs will be given during the afternoons and evening throughout the entire week of October 11 to 16, inclusive, during which the Oil-World Exposition will be held.The aim of the exposition is to disseminate data on operating methods for all branches of the industry as well as present a complete display of equipment for field and plant use.

ANTHONY CZACZKOWSKI, of Saginaw and Roy J. Van Steenburg and Charles E. Renaud, both of Flint, have organized the Bridgeport Oil & Gas Development Company. The firm has been granted a Michigan corporation franchise.

TEXAS GULF COAST

Newton County wildcat may usher in Cockfield pool.

* * *

Coyle-Concord finally gets paying well at Garwood.

* * *

Republic gets new sand at Spurger at 7705 feet.

Houston.—Interest in the Texas sector of the Gulf Coast last week centered around two new discoveries, one in Newton and the other in Colorado County, and a showing of gas in a core hole test in San Jacinto County.

Prospects of a new field in Newton County looked bright last week when Houston Oil Company and Republic Production Company cored oil sand in Cockfield formation at 6909 to 6927 feet and set 7-inch casing at 6987 feet in Pevey Moore Lumber Company 1. The wildcat was drilled to 7069 feet and encountered water sands from 7029 to the bottom. A drill stem test from 6775 to 6929 feet showed 2 stands of oil and 6 stands of oily mud in 18 minutes through a ¼ and a ⅜-inch choke.

May Cause More Drilling

This wildcat probably will open the first commercial oil production for Newton County. It is 10 miles from the Louisiana border and may lead to further drilling in this area for Cockfield production. Also Continental Oil Company's Tate 1 in Evangeline Parish, which indicates it will produce oil from the Sparta formation, adds possibilities of production at the Newton County wildcat for the lower formation.

The two operators recently discovered Sparta oil at Spurger field, Tyler County. From all indications, the Spurger, Newton County, discovery, and the Continental Oil Company well in Evangeline Parish will cause the Conroe trend in the two districts to come in for its share of deep drilling.

First Oil Field for Colorado County

The first oil field for Colorado County is Garwood. Coyle Concord Oil Company's Mary South 2, I&GN No. 41, came in last week flowing 75 barrels of 55 gravity distillate daily through a 3/32-inch choke, with a tubing pressure of 2200 pounds and a casing pressure of 2300 pounds, from 6034 feet. The wildcat has been shut in for storage.

There have been several wells drilled on the Garwood prospect, but Mary South 2 is the first well to show oil in profitable quantities. The hole was drilled to 6034 feet after topping sand at 6032 feet.

Considerable interest is being shown in J. Mayo's Gibbs 1, approximately 6 miles northeast of Oakhurst, L. Enriquez Survey, San Jacinto County. Gibbs 1 blew out at 1350 feet and bridged. Top of the gas sand was logged at 1333 feet. A drill stem test was made from 1330 to 1350 feet in 20 minutes and it showed a 200-pound pressure. In 18 minutes the well started showing salt water. The hole will be cored deeper.

In the Aldine area, Harris County, Texas Gulf Production Company's Moore 1, WCRR No. 18, was reported to be running 178 feet higher on structure than the company's Gillespie 1, 3000 feet west of Moore 1. The interesting wildcat topped the Cockfield at 6552 feet and encountered 5 feet of sand and shale with an odor of oil and gas at 6718 feet. Last week the crew was preparing to core below 6827 feet and will probably drill below 7000 feet.

Republic Production Company's Hurd 4, 933 feet north of Hurd 3, N. Hurd Survey, Spurger area, which discovered a deeper producing horizon last week, proved productive. Hurd 4, Tyler County, made 520 barrels daily through ¼-inch choke, with tubing pressure of 1025 pounds and casing pressure of 1000 pounds, from 7705 feet.

Maco Stewart's Maco Stewart 1, Hitchcock prospect, J. Spillman Survey, Galveston County, last week showed 219 barrels of 32 gravity oil in 24 hours through ¼-inch choke and had tubing pressure of 425 pounds and casing pressure of 650 pounds. Gas/oil ratio was 376 to 1. The well was completed in sands at 5134 to 5140 feet after casing was perforated with 24 holes.

In Fort Bend County, Humble Oil & Refining Company abandoned Schulze 1, Needville prospect, R. Hodge Survey, at 4824 feet after running low on structure.

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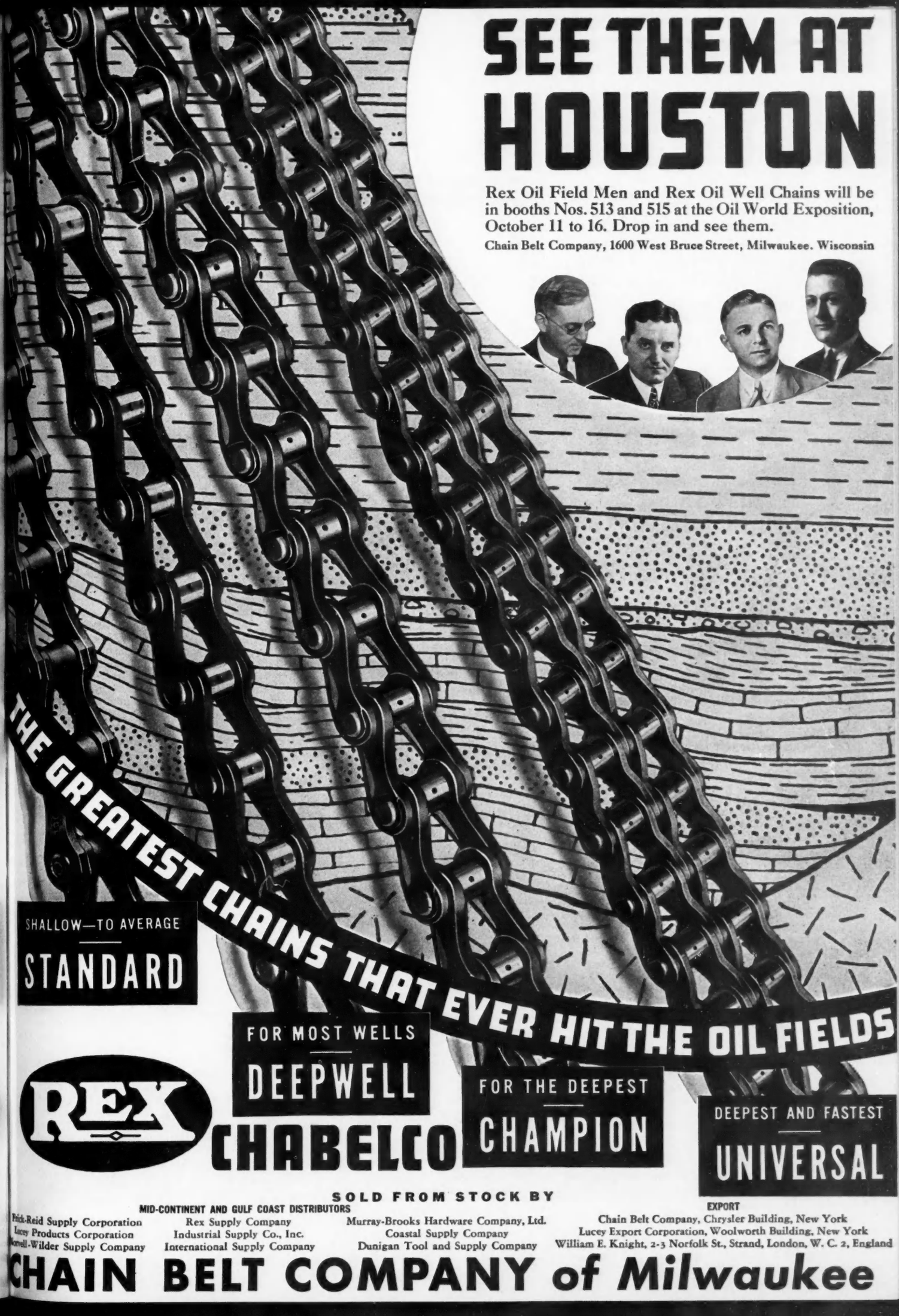
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son 1, a mile northeast of production, C. Breen Survey, Brazoria County, perforated casing with 40 shots in 15 feet of sand from 10,635 to 10,650 feet and was making a production test at the end of the week. The hole was drilled to 10,751 feet and 7-inch casing set at the bottom. Horseshoe Bayou field, South Louisiana, producing at 10,890 feet, is the world's deepest.

Northeast of Bonney in Brazoria County, Jack Frazier abandoned Temple Lumber Company 1, H&TC Survey, Section 35, at 7515 feet after coring salt water sands. This makes the third wildcat abandoned in the area in three weeks.

Another attempt to whip heaving shale at Bryan Mound, Brazoria County, proved futile last week when The Texas Company abandoned Robbins 2, J. W. Broughem Survey. The hole was plugged at 7530 feet after 9⅝-inch casing parted.

H. J. DeArman's second well at Sandy Point, Fite 2, D. Talley Survey, was waiting on cement to set last week at 6505 feet after running a string of 5½-inch to 6488 feet. Top of the oil sand was logged at 6489 feet.

Friendswood Extended Northwest

Friendswood was extended northwest last week when the fifth producer was completed. Humble Oil & Refining Company's Gray 1 made 674 barrels daily through a ¼-inch choke at 6013 feet. Casing was cemented at 5790 feet. The company has completed three wells in the field, and Vic Borsodie has two wells flowing.

West of production at Turtle Bay field, Chambers County, Stanolind Oil & Gas Company's Silva 2, S. Burney Survey, was preparing to make a production test at 6580 to 6600 feet. The well showed 1800 feet of pipe line oil in 10 minutes through ¼-inch chokes, with a pressure of 100 pounds.

Texas drilling permits register sharp decline

Austin.—The Texas Railroad Commission last week approved permits for drilling 206 new wells in Texas, 169 less than were allowed the week before.

In East Texas field there were only three permits reported, two in Smith and one in Rusk County. East Central Texas listed 12 scattered locations.

West Texas reported 36 new locations, all scattered, while the Panhandle area listed 13 permits.

There were 23 new locations in the North Texas district. West Central operators listed 19 scattered permits.

In Southwest Texas there were 62 new locations, including 27 in Webb County, 15 in Duval, and 10 in McMullen County. The Gulf Coast area reported 38 permits scattered throughout the district.

Los Angeles Chapter of A. P. I. meets October 12

Los Angeles.—The next meeting of the Los Angeles chapter of the American Petroleum Institute will be held October 12, according to L. George Trembly, secretary and treasurer of the chapter. Program of the meeting will be announced later.

Possible Sparta zone producer to perforate higher.

* * *

Gulf to plug back to complete Timbalier discovery.

* * *

Continental wildcat has gas show at 11,629 feet.

Lake Charles.—Continental Oil Company's F. Tate 1, Villa Platte area, Section 44-3s-2e, Evangeline Parish, indicates it will open a new oil field and discover a new Sparta producing horizon for the Louisiana Gulf Coast. But due to mechanical difficulties, the preparations are being made to clean the hole out and perforate casing a little above the original perforations. While swabbing down to 6000 feet last week the swab was lost. After putting pressure in the hole the swab failed to return to the top. Another swab was run and at 10 a. m. September 14 the well kicked off and came in flowing at the rate of 24 barrels of 36.2 barrels per hour, seven percent wash water, through a ⅜-inch choke. Tubing pressure was 750 pounds and casing pressure was 200 pounds. After flowing for a few hours the well died. Swabbing was resumed, and this time part of the rubber was lost.

Before the testing commenced, the 7-inch casing, which was set at 9100 feet, was perforated with 34 holes from 9015 to 9035 feet. It was believed that there were not enough holes, or that the shots did not go far enough into the formation. Another production test will be made next week after the hole has been reworked.

Continental Oil Company's Tate 1 has created considerable excitement in the Louisiana Gulf Coast. During the testing of the well, lease brokers, scouts, geologists, and spectators were at the well waiting for information. All knew if the well produced commercial oil from Sparta formation it would mean renewed geophysical work and leasing along the Conroe trend. Large blocks which have been dropped during the past year as rentals came due would be released.

More Salt Water at North Crowley

On the North Crowley prospect, Section 34-8s-1e, Acadia Parish, Humble Oil & Refining Company's Federal Land Bank 1 recovered more salt water on another drill stem test last week. Over 20 drill stem tests have been made on this wildcat, the last being from 8394 to 8400 feet, where casing was perforated with eight holes. The last test was made in 28 minutes through ¼-inch chokes and showed 300 feet of gas cut mud, 250 feet of oil and gas cut mud and oil, 400 feet of salt water, and a 50-pound pressure. The gravity of the oil was 32 degrees. Federal Land Bank 1 has been plugged back to 8260 feet and was waiting on cement to set last week.

Gulf Oil Corporation has decided to complete State PP3, Timbalier Bay

TEXAS GULF COAST
Completions

Company, Well and Location	Init. Prod Bbls.	Depth
AMELIA—		
Humble Pinchback 5	650	6776
Tyrell Combest 9	515	6780
Tyrell Combest 16	648	6779
ANAHUAC—		
Humble, Middleton 28	628	7080
BAMMEL—		
Superior, Butler 1, dr to 10,519 ft, pb 6170 ft	¶31	6170
BRENHAM—		
Virginia Oil Co. Kenieczny 3	*	580
BRYAN MOUND—		
Texas Co., Robbins 2	*	6530
CLAY CREEK—		
Oak Oil Corp., Cockrell et al 2	*	1678
FRIENDSWOOD—		
Humble, Gray 1	674	6013
HASTINGS—		
Stanolind, Condon 4	607	6100
Curkeet 9	567	6080
Law 5	408	6080
Long 3	551	5680
Matsushita 1	590	6080
Randall 1	552	6080
Turner 10	580	6080
HIGH ISLAND—		
Stanolind, Smith A-15	*	6425
HULL—		
Texas Co., Hannah Fee 8	648	4975
LOCHRIDGE—		
Dr. C. M. Lusk, State 1	191	6369
NOME—		
Sun, Paggi 4	265	6045
PIERCE JUNCTION—		
Rio Bravo, Fee 12	449	4204
SILSBEE—		
Republic, Brooks 21	409	6910
SPURGER—		
Republic, Hurd 4	520	7705
TOMBALL—		
Humble, Krahn 1	61	5580
Sherer 3	195	5579
Shell, Prichford 1	192	5573
BRAZORIA COUNTY—		
Jack Frazier, Temple Lumber Co. 1, e of Bonney, H&TB No. 35	*	7515
S. W. Russell 1, ne of Bonney, J. M. Allen sur	*	lcn.
COLORADO COUNTY—		
Coyle Concord, South 2, Garwood area, I&GN No. 41	75	6034
FT. BEND COUNTY—		
Humble, Schulze 1, Needville area, R. Hodge sur	*	4824
GALVESTON COUNTY—		
Maco Stewart, Maco Stewart 1, Hitchcock prospect, J. Spillman sur	219	5156

*Failures; †Junked; ¶Million cu. ft. gas.

area, Section 36-23s-21e, Lafourche Parish, after having cored a sand with an oil odor from 7148 to 7153 feet. The hole was plugged back to 6971 feet.

State PP 3 indicated it would open a new oil field when two drill stem tests showed pipe line oil. The last, from 6820 to 6970 feet, showed 2520 feet of 31 gravity pipe line oil in 11 minutes. Nine and five eights-inch casing was set at 6832 feet and it is believed the company will run 5-inch liner to the bottom and perforate.

Jeanerette Sands at 10,280 Feet

The first 10,000-foot well for Jeanerette field, St. Mary Parish, indicated that it may open a new producing horizon from 9716 to 10,290 feet. Herton Oil Company's Banta Roanes 1, Section 40-13s-9e, drilling in shale at 10,380 feet last week, cored sands showing oil from 9668 to 9716 feet, 10,194 to 10,215 feet, and from 10,280 to 10,290 feet. The company will drill deeper.

At Charenton, St. Mary Parish, Pan American Production Company was making a production test on Veeder 1 in a new sand, the shallowest sand in the field. Veeder 1, Section 30-13s-10e, perforated casing with 20 holes from 2589 to 2593 feet and after setting screen and liner.

Salt Water in South Roanoke Well

Union Sulphur Company's T. R. S. Farms 1, South Roanoke, Section 23-10s-4w, Jefferson Davis Parish, showed salt water again on a drill stem test. When casing was perforated with 28 holes from 8599 to 8603 feet the test showed 40 stands of oil and salt water, 28 stands of salt water, two stands of sand, and a 50-pound pressure through ¼-inch chokes. The perforations have been squeezed with cement.

Deepest Active Well Has Gas Show

Continental Oil Company's Brookshire 1, Abbeville area, Section 66-12s-3e, Vermilion Parish, was drilling below 11,750 feet at the end of the week after encountering a gas show at 11,629 feet. Brookshire 1, the deepest active well in Louisiana, has had several gas showings. Every time the pipe is taken out of the hole it "kicks." Continental's Hebert 1, the discovery well is making about 30 barrels of 52 gravity distillate daily, along with a large volume of gas. The distillate is shipped out by tank cars.

Another 10,000-foot producer was reported at Lafitte, Jefferson Parish. The Texas Company worked over L. L. E. Lafitte 5, perforated casing at 9974 to 10,020 feet, and it came in for 643 barrels daily.

East of production at Lafitte, The Texas Company's State Bayou Norman 1, Section 28-17s-24e, was drilling below 11,463 feet last week. It is the deepest well ever drilled at Lafitte.

Lirette Loses Title

Lirette, Terrebonne Parish, is no longer the deepest producing field in the world. That honor was lost last week when Humble Oil & Refining Company's Ellender 1 was plugged back to 10,635 feet for a production test. The well was producing from 11,630 feet, but started making salt water. The deepest producing field in the world is Horseshoe Bayou, St. Mary Parish, which is producing from 10,890 feet.

SOUTH LOUISIANA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BLACK BAYOU—		
Shell, Watkins 38	650	5140
CAILLOU ISLAND—		
Texas Co., State 44	887	3695
GILLIS—		
Union Sulphur, Bell 3	*	7724
LAFITTE—		
Texas Co., L. L. E. Lafitte 5 (wo)	643	10,020
LEEVILLE—		
Texas Co., L. L. E. Leeville 66	64	3567
WEST HACKBERRY—		
Stanolind, Carter Sweeney 9	*	5429
LIVINGSTON PARISH—		
Neville & Crubbs, Evans 1, Mallet Bluff area, 47-7s-3e	*	7656
PLAQUEMINES PARISH—		
Humble, Orleans Levee Board 10, Potash area, 10-18s-15e	*	964

*Failures; †Junked; ¶Million cu. ft. gas.

Louisiana issues 32 permits for new wells

Shreveport.—Thirty-two drilling permits were issued last week by the minerals division, Louisiana Conservation Commission. Sixteen were for north Louisiana, divided among the following parishes: Bossier, one; Caddo, three, including two in Rodessa; Claiborne, five, all in Lisbon; DeSoto, one; Morehouse, one; Ouachita, one; Red River, two; Union, one; and Webster one. Those in south Louisiana were divided among the following parishes: Acadia, one; Ascension, one; Cameron, three; Iberia, two; Iberville, one; Jefferson Davis, one; LaFourche, one; Plaquemines, one; St. Martin, one; St. Mary, three; Terrebonne, one.

Construction starts on new Corpus refinery

Corpus Christi. — Construction has started on the Pontiac Refining Corporation's 4000-barrel refinery on the Corpus Christi ship channel, the project to include a terminal with storage capacity to exceed 235,000 barrels. Mid-Continent Engineering Company of Dallas has the contract.

The company is associated with the Pontiac Pipe Line & Export Company, and the development will be operated in conection with the company's gathering and marketing system.

This new plant is to be located between the Southern Alkali Corporation and Barnsdall Refining Corporation's plants. A 12-inch pipe line from the site to the Barnsdall dock on the ship channel will give the plant an outlet for its crude and refined products.

Barnsdall interests are rushing a plant to completion which will have a capacity of around 15,000 barrels per day.

A large crowd gathered at Continental Oil Company's Tate 1, discovery well at Villa Platte, Evangeline Parish. Those not connected with the company were kept away from the well. This discovery is considered the most important in the Louisiana Coast in years.

Two Lisbon outposts are showing for producers.

* * *

Rodessa field shows bottom-hole pressure drop.

Shreveport.—One fourth mile east of production, T. L. James and Company's D. E. Fowler 1, center of the west half of NE SW 32-21n-4w, at Lisbon, logged eight feet of saturation from 5202 to 5210 feet and was preparing to run an electrical tester before setting final casing string; elevation is 230 feet.

Lisbon Oil Company's Burgess 1, Section 3-20n-5w, 2 miles west of Lisbon production, flowed 247 barrels in 12 hours ending at 7 a.m. Friday, following acidization, and later gauged 38 barrels per hour through ½-inch tubing choke. Plugged back depth is 5325 feet.

Rodessa bottom-hole pressure declining

Shreveport. — United Gas Company is installing gas compressor units on its Fields, Rambo and Stewart leases in the Cass County, Texas, part of Rodessa. At present on the Louisiana side of Rodessa there is a total of 15 gas compressors and an equal number of pumping units.

Compressors have been tried on two wells in the Miller County, Arkansas, extension of Rodessa.

Bottom-hole pressure weighted average on the Louisiana side of Rodessa dropped an average of .97 pound per day for the 31 days of August to an average for this side of the field of 1680 pounds, according to data compiled by engineers of the Rodessa Operators Committee. The bottom-hole pressure is shown by 83 key wells in the Young and Gloyd formations.

Only one completion in Miller County end of Rodessa

Shreveport. — Although the Miller County, Arkansas, end of Rodessa continued to be the most active portion of that field, it added only one new well last week. Freeman W. Burford's Eason 3, NE SE 11-20-28, which started flowing estimated 40 barrels per hour through five-eighths inch tubing choke from total depth of 6075 feet after using acid. This test logged Mitchell sand from 6035 to 6054 feet and porous lime from 6060 to 6073 feet; elevation is 245 feet.

Burford's two outposts in Miller County are August 1, SW SE NE SW 8-20-27, which is drilling shale at 5230 feet, and Garver Means 1, SW NW 11-20-27, which is drilling shale at 4326 feet.

The first salt water to make its appearance in Miller County was reported last week in Robert Brothers' Capps 1, SE NW SE 10-20-28, which is making seven percent water. This well logged Mitchell sand from 6084 to 6092 feet and porous saturated lime from 6100 to 6119 feet; elevation is 291 feet.

Eleven new locations were made in this area last week. Some buying continues outside of production in Miller County. W. C. Feazel leased the west half of NW 9-20-27, and the east half of NE NW 8-20-27.

Test in Lodi offshoot of Rodessa makes 288 barrels

Shreveport. — Mid-Continent Petroleum Company's Sory 2, A. de Los Santos Coy Survey, Lodi offshoot of Rodessa, in Marion County, Texas, gauged 288 barrels in 24 hours last week from total depth of 6108 feet. This test logged Henderson sand from 6076 to 6095 feet and topped the saturated Gloyd lime at 6012 feet.

Arkansas-Louisiana Gas Company's J. P. Fant 1, L. P. Cadenhead Survey, in the same part of the field, which was plugged back to 6158 feet, rises about 1200 feet in oil each night and swabs dry daily. Old total depth is 6188 feet, where salt water showed in testing as it did at 6178 feet.

Marion end of Rodessa gets another setback

Shreveport. — Another setback was given to the Lodi, Marion County, Texas, nose of Rodessa last week when The Hunter Company's Fonda 3, A. de los Santos Coy Survey, which had shown some salt water when tested in the Henderson sand with total depth of 6151 feet and was deepened to the Gloyd, logged 18 feet of dense lime and shale from base of the Henderson at 6149 feet to top of the Gloyd at 6167 feet, this lime being very porous and carrying a heavy saturation of salt water. The well was immediately plugged back to the Henderson horizon at 6127 feet, and cement will be drilled out carefully and tests made, but it definitely eliminates a considerable amount of potentially productive acreage, and causes a revision of the water level which tentatively had been placed at sub-sea depth of 5820 feet, from the behavior of Arkansas-Louisiana Gas Company's Fant 1, L. P. Cadenhead Survey, to the north. Some shooting pictures would indicate there was minor faulting outside Fonda 3.

The Hunter Company's Fonda 3 having logged the water level at sub-sea depth of 5814 feet, and United Production Corporation's Hutchinson 1, same survey, having been completed as a good oil well with sub-sea depth of 5816 feet, is explained by the presence of the lime and shale streak that was not so pronounced in the commercial well.

Wildcat near Simsboro field shows gas and mud on test

Shreveport.—Three fourths of a mile east of the two gas producers in the Simsboro (Montcalm) field, Lincoln Parish, T. L. James and Company's Spencer 1, center of the west half of NE 11-17n-4w, tested an estimated 5 to 15 million feet of gas and 10 joints of mud in a 15-minute drill stem test of Travis Peak formation from 6340 to 6619 feet; elevation is 365 feet. Three subsequent attempts at a more satisfactory test were unsuccessful.

One of the gas-distillate wells at Simsboro produces from the Travis Peak and the other from basal Glen Rose.

Plan more drilling in Blanchard gas area.

Shreveport.—In the Blanchard gas area of Caddo Parish where United Gas Company some time ago completed a 4,000,000-foot gasser at 5911 feet, W. A. Haynes, A. O. Olsen and W. E. Hall have taken approximately 800 acres of leases for a 6500-foot test to be started by September 25. Tentative location is Sharp 1, NW NW 15-18n-16w. United Gas Company's well was Wheeler A-1, Section 16-18n-16w.

United Gas Company has just completed working with seismograph its 12,000-acre block around Section 13-21n-5w, 3 miles north of Lisbon production. This company's Meadows 1,

NORTH LOUISIANA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CLAIBORNE PARISH (Lisbon)—		
Atlantic Ref., S. E. Tatum A-1, 31 21n-4w	680	5211
S. E. Tatum B-1, 32-21n-4w	290	5284
R. L. Bauman et al, M. S. Patton 2, 1-20n-5w	975	5304
Hollyfield & McFarlane, Maggie Patton 4, 31-21-4w	404	5311
Sells Pet. Co., Bean 2, 32-21n-4w	1400	5142
Jones 2, 31-21n-4w	800	5320
LINCOLN PARISH (Lisbon)—		
W. F. Lacey et al, L. Caruthers 2, 6-20n-4w	1660	5341
Olsen Drlg. Co., Aycock 1, 6-20n-4w	186	5372
BOSSIER PARISH (Bellevue)—		
Arkansas Fuel Oil, Bodcaw Lbr. Co. A-19, 15-19n-11w	5	450
DE SOTO PARISH—		
Paul L. Miller, P. A. Barron 1, 36-11n-11w	*	2967
MORFHOUSE PARISH (Monroe)—		
United Gas, Crosett Lbr. Co. 56, 13-21n-4e	¶1	2250
Crossett Lbr. Co. 57, 22-21n-4e	¶2½	2190
OUACHITA PARISH (Monroe)—		
J. & H. Oil Co., Frost Lbr. Co. A-5, 35-19n-3e	¶1½	2187
RED RIVER PARISH—		
Yandell Rogers, Caspari 4, 27-13n-11w	†	2462
CADDO PARISH (Pine Island)—		
W. D. Ambrose, J. B. Files 1, 10-20n-15w	150	2197
Surf-Maja Oil Co., Satellite 1, 10-20n-15w	85	2190

*Failures; †Junked; ¶Million cu. ft. gas.

drilled to 6512 feet in this section, had been oozing a small amount of oil for several months before the discovery well was drilled at Lisbon.

Shreveport.—Standard Oil Company of Louisiana and A. G. Oliphant's E. L. Stewart 1, Section 32-21n-10w, recently completed 1½-mile southwest extension of the lower Marine Cotton Valley field, because of its low oil-gas ratio has been given an allowable of 372 barrels of distillate daily. The lower Marine horizon of Cotton Valley, classed as a gas field, has a daily allowable of 35,000,000 cubic feet.

Miller County extension of Rodessa gets 11 permits

El Dorado.—Eleven drilling permits, all for the Miller County extension of Rodessa, were authorized last week by the Arkansas Board of Conservation. The permits follow:

Stanley Rogers, A. L. Treadway 1, 330 feet north and 165 feet east SWc SE SE NE 10-20-28; J. Roussell Ferrell, Brown 1, 99 feet north and 330 feet east SWc NE SW 1-20-28; S. H. Vance, Ford and Worthen 1, 330 feet north and 105 feet east SWc SE SE 1-20-28; W. L. McClanahan, T. P. Greer 1, 330 feet north and west SEc SW NW 11-20-28; Kroll and Travis, K. K. Dickson 1, 330 feet north and east SWc SE NW 11-20-28; F. W. Burford, G. G. Gerald B-2, 33 feet east of west line and 465.7 feet south of north line fractional SW or fractional NE 15-20-28; A. J. Cross 1, 600 feet north and 300 feet east SWc east half SE NE 11-20-28; Mary O'Hern 2, 330 feet south and west NEc SW 10-20-28; Mary O'Hern 3, 330 feet south and west NEc SE SW 10-20-28; A. A. Capps 1-E, center north 20 acres of west 40 acres of fractional section 13-20-28; A. A. Capps 1-F, 330 feet north and east SWc 12-20-28.

El Dorado, Ark.—Edwin M. Jones' Marine Oil Company 1, NW SW SE 17-18-17, which logged 51 feet of formation showing oil in the Big Lime, and had 7-inch OD casing cemented on bottom at 7615 feet, is ready to drill in. Additional cores probably will be taken, as bottom of the hole was still in the saturated horizon.

The sand in this test is said to have been dolomitic, believed probably the result of erosion to the north on the flank of the lime basin.

Columbia and LaFayette counties continue to see some wildcat leasing. In the former, Hunt Oil Company is leasing in Townships 18 and 19, Range 20, and Devonian Oil Company is taking some leases in Township 18, Range 21. Hunt also is leasing in LaFayette County in Sections 32, 33 and 34-18-26, and Root Petroleum Company in the same county has been leasing in Township 19, Range 26.

Gulf using marsh buggy in Florida Everglades

Tampa.—Gulf Oil Corporation has brought marsh buggy into the Everglades region of south Florida, following work in the region on a million-acre block with two gravimeters since May 1. Reports are a seismograph crew is due to arrive soon to follow up work of the gravimeters on the block.

Large Florida lease taken

Coral Gables, Fla.—Adjoining on the south the million acre block of Gulf Oil Corporation in the Florida Everglades, a group of operators headed by William Gregg Blanchard recently obtained from the state oil and gas leases on a block 24 miles square, embracing all the state owned land in Townships 56, 57, 58 and 59 of Ranges 31, 32, 33, and 34. The lease was turned to Everglades Oil Company, with which Blanchard is connected.

ARKANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CLEVELAND COUNTY—		
J. R. Lockhart, Ida Robertson 1, 36-10-11	*	3987
NEVADA COUNTY (Troy)—		
Bruce E. Wallace, Wm. Haynie 3, 6-14-20	5	1166

*Failures; †Junked; ¶Million cu. ft. gas.

East Mississippi test planned to 5000 feet

Jackson, Miss.—Jerry Ryan of Shreveport has taken under option until October 1, 8000 acres of land from Long-Bell Lumber Company in Township 2 North, Range 17 East, Clarke County, east central Mississippi, bordering the Alabama line, for a proposed 5000-foot test. This block is just north of the Hatchetigbee anticline on which Joe Modisett and associates are drilling a proposed 8000-foot test at McCorvey 1, Section 20-9n-2w, Choctaw County, Alabama.

The best oil showing ever logged in Mississippi, aside from some asphaltic oil in the Jackson gas field and in Lamar County on a salt dome, was secured in top of the Eutaw (Blossom) in Gulf Refining Company's Long-Bell 1, Section 10-2n-16e, Clarke County, from 3692 to 3700 feet. This well, it was estimated, would have made a 5-barrel well.

Modisett's test on the Hatchetigbee last week was drilling in fossiliferous shale below 4200 feet after topping fossiliferous black shale at 4100 feet in what was identified as an upper Cre-

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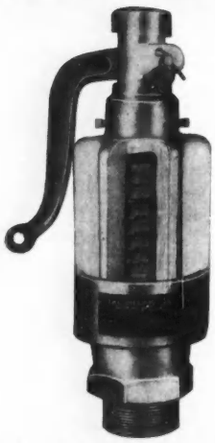
New Iberia—Rodessa—Monroe—Cotton Valley—Turnertown—Greggton—Houston

taceous marine formation, immediately underlying the Huscaloosa (Woodbine) formation.

Jackson, Miss. — Electrical logging device was run last week in Charles Green and associates' Julian Taylor 1, Section 4-3n-1e, Wilkinson County, southwest Mississippi, "in the trend" to 4035 feet in what was identified as Minden limestone. This was to be followed by running of formation tester as the electrical device showed some porosity and resistivity at 2376-2400 feet and then showed 5 ohms in 7 feet of sand immediately overlying 19 feet of salt water sand at 2460 feet; elevation is 251 feet.



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EASTERN FIELDS

Four important extensions in Illinois Coal Basin.

* * *

Possibility of linking Clay City and Noble pools.

* * *

Much leasing in Knox and Greene Counties, Indiana.

Pittsburgh, Pa.—Four important extensions to pools in the Illinois Coal Basin area loomed Tuesday along with indication that the Clay City pool of Clay County and the Noble pool of Richland County were one, as cores taken at three wildcat tests showed heavy saturation and a fourth was being swabbed. Two other wildcats were coring McCloskey sand, formation of heaviest production thus far opened in the area.

Two-Mile Extension

Myers & Fitzpatrick's A. Shannon 1, Section 26, Zif Township, northern Wayne County, was expected to yield 1000 barrels a day when the production is started. It extends the Clay City field 2 miles farther south than the similar extension made three weeks ago by Duncan Oil Company's Carroll 1 in southern Clay Township, Clay County.

Indication that Clay City field, this week extended into Wayne County by the Shannon 1, includes what has been known as the Noble pool in Richland County to the east (opened by Ohio Oil Company's E. H. Arbuthnot 1, completed last month with an initial of 2500 barrels daily) is given by Wicklund Development Company's wildcat, Mary E. McCauley 1, Section 23, Clay City Township, on the Richland County line. It cored 12 feet of McClosky pay and is expected to make a fair well.

Northeast of Noble pool and indicating an extension towards or into Jasper County, Mammoth Oil Company's Leo Heitz 1, Section 34, Township 3n-9e, Noble Township, Richland County, took a core that indicated a well of 500 to 1000 barrels.

In Clay City Township, Clay County, Hupp et al's Bemis-Buchanan test, Section 14, Township 3n-8e, 1½ miles north of the McCauley well, cored a fair McClosky saturation.

To Deepen Discovery

Pure Oil Company's E. Weiler 1, which started the intensive development campaign in the Clay-Wayne-Richland County area early this year when it attained production of 40 barrels at 2613 feet, the Weiler sand, is to be carried down 300 feet to the McClosky. It is the only well in the field producing from the upper level, all others having been carried to the McClosky formation since the same company's Bunny Travis 1 came in late in May with an initial of 2600 barrels daily.

Fifty-Six Active

Fifty-six other tests were active in Clay, Wayne and Richland counties as the week opened. Of these, 13 had derricks up but were awaiting rigs to be brought in from other fields or to be released from tests near the completion stage. Several locations have been announced, but the time for operations to start is indefinite because of the shortage of equipment.

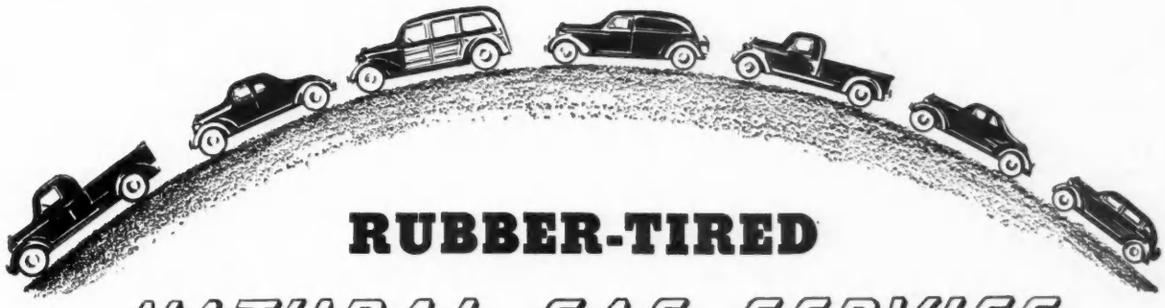
To Drill 15,000-Acre Block

E. O. Phelps and O. W. Dickerson, Oklahoma operators, have acquired leases on 15,000 acres in southern McLean County and northern Dewitt County, and will start a wildcat test 10 miles south of Bloomington not later than December 14. A strike in this area, on the northern edge of the central Coal Basin area, will extend development far north of the present center of activity.

Extensive lease activity in northern Knox and Greene counties, Indiana, has been apparent during the past few weeks, and a test is to be made near Worthington soon. This lease play is south and east of Vigo County, where Carter Oil Company and other companies are engaged in development work.

Deep sand gas tests in northeastern Pensylvania and in the Pennsylvania-New York Oriskany fields commanded attention in that area. After failures of several deep tests in Warren County, Pennsylvania, Kane Industrial Gas Company's test on Government Surface Lot 515, Watson Township, gave operators encouragement when it encountered in the Onondaga limestone a show of gas at 4831 feet. Previous wells in the county came in with open flows in excess of 1,000,000 cubic feet a day, but quickly turned to salt water. The Kane Company's test is located higher on structure, having topped the Onondaga 76 feet higher than the discovery well. The test is now drilling on towards the Oriskany.

In the Pennsylvania-New York area, 8 completions were reported, 3 of which were in the recently opened Woodhull field, Steuben County, on



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● An endless moving parade of motor vehicles, marked with the insignia of the United Gas System, rolls up thousands of miles a day—millions of miles a year—over the South and Southwest, helping to carry on the business of the System.

Here's a 10-ton truck loaded with drilling machinery, rambling along to some distant Natural Gas field . . . or a light car with a Gas engineer at the wheel going to inspect a transmission line . . . each playing a vital part in the great Natural Gas drama-on-wheels that goes on beyond the service you receive in your home.

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the New York side. Five wells have now been completed in this field, all of which are good producers. Southwestern Development Company's wildcat on the Shearer tract, Dix Township, Schuyler County, was plugged after finding the Oriskany dry at 2284-97 feet. Total depth was 2340 feet.

EASTERN FIELDS
Completions
OHIO

Company, Well and Location	Init. Prod. Bbls.	Depth
ASHLAND COUNTY—		
Faulkner & Phelps, Gus Z. Humm 9	8	947
Ohio Fuel Gas, Anna Fulner 1..	¶.17	2900
ATHENS COUNTY—		
Ohio Fuel Gas, F. I. Caldwell 1...	¶1.77	1275
John M. Chope 2	¶.79	1410
A. D. Townsend, Minnie Loeffler 1	¶.04	1740
C. S. Parks et al, Aaron Ball 1.....	¶.03	1590
BELMONT COUNTY—		
Harry A. Dague et al, Peter Macysseyn 2	8	1678
Lewis et al, Wm. F. Barrett 2.....	*	1801
COSHOCTON COUNTY—		
Kundtz-Hulse, Inc., et al, R. L. McKee 5	40	3156
HOCKING COUNTY—		
Preston Oil Co., Sunday Creek Coal Co. 153	40	3678
HOLMES COUNTY—		
Pure, Stephens Cornf 1	*	3494
Bell Bros., Emma Fair 1	*	944
KNOX COUNTY—		
Upham Gas Co., Robert Crider 1..	*	2840
Millwood Sand Co., Robert Lepley 2	*	650
LICKING COUNTY—		
Pure, H. E. Longhman 8	2	3022
LORAIN COUNTY—		
Ohio Fuel Gas, John Solet 2.....¶1.26		2245
John Kopeso 1	¶.17	2447
MEDINA COUNTY—		
Ray Grim et al, B. E. Grim 2.....	5	470
MEIGS COUNTY—		
H. M. Nelson, Asbury Bryant 1....	*	825
MONROE COUNTY—		
Hines Bros. et al, Nancy M. Smith 1	¶.03	870
Sutton Bros., J. H. Rosenlieb 17...	*	1475
MUSKINGUM COUNTY—		
Hopewell Gas & Fuel Co., Wm. Wentz 3	*	4150
NOBLE COUNTY—		
W. S. Boone Oil & Gas Co., L. C. Wilson 6	1	620
E. O. Burbacher, F. M. Caltand 3..	¶.05	1200
PERRY COUNTY—		
Preston Oil Co., Sunday Creek Coal Co 1653	¶1.00	1160
Hopewell Gas & Fuel Co., Louis Cullman 2	¶1.26	3000
John Hullman 2	¶.20	2990
STARK COUNTY—		
Lyons et al, Joe Burger 1	¶.43	4507
SUMMIT COUNTY—		
Wise et al, Harry Lamson 1.....	¶.72	522
VINTON COUNTY—		
Kelch Bros., E. C. Worthman 3..	¶.04	799
WASHINGTON COUNTY—		
Wm. B. Depuy et al, John M. Stegner 1	¶.05	1110
J. L. Herlan, Hulda Hopple.....	¶.04	1690
Elmer Wickins, Elmer Wickens 1...	*	2135
Payne Oil & Gas Co., C. F. Payne 7	*	1937

WEST VIRGINIA

Company, Well and Location	Init. Prod. Bbls.	Depth
BRAXTON COUNTY—		
Pittsburgh & West Va. Gas Co., A. J. Wright 7634	¶1.24	1280
CABEL COUNTY—		
Guy B. & G. T. Ray, Hugh Adkins 1	¶.50	3586
CALHOUN COUNTY—		
Jeff Miller et al, Bart Wears 2....	¶.31	2261
Godfrey L. Cabot, Inc., Orlando Wayne	*	2496
GILMER COUNTY—		
Pittsburgh & West Va. Co., Mary L. Fitzpatrick 2	¶.40	1651
C. L. Carson Heirs 2	*	2047
KANAWHA COUNTY—		
Spartan Gas Co., Avilee Baldwin 2.	¶5.96	5037
Godfrey L. Cabot, Inc., John T. Bonham 1	¶1.50	4835
Nellie B. Tompkins 6	¶.55	4463
Columbian Carbon, Mary C. Young Heirs 1	¶1.05	4886
LINCOLN COUNTY—		
Summer & Swanson, J. A. Thompson 2	¶2.00	3140
Martin Gas Co., Wilkerson & Summerson 1	¶1.80	....
MARION COUNTY—		
Curt B. Fleming, J. J. Ferrell et al 1	¶.50	2146
PLEASANTS COUNTY—		
United Fuel Gas, Owen Kirkhart 4732	¶.20	1814
RITCHIE COUNTY—		
J. W. Jones, West Virginia Oil Co. 30	1	500
Frymeir & Co., Geo. Hammer Estate 6	*	2171
ROANE COUNTY—		
O. D. Jones, W. H. Westfall 2....¶1.00		1685
Hope Natural Gas, Mary Goff 7782	¶.75	2281
TYLER COUNTY—		
Gale Oil Co., Geo. T. Gale 20.....	1	1507
WETZEL COUNTY—		
Geo. F. Eagan, F. T. & L. V. West 1	10	2970
Brown Run Gas Co., T. H. Meighen 1	¶.11	2975
WIRT COUNTY—		
Septer W. Douglas, Al Blankenship 1	*	1090
WOOD COUNTY—		
E. C. Hartman, P. Stilenbar 1.....	½	1800

KENTUCKY

Company, Well and Location	Init. Prod. Bbls.	Depth
DAVIESS COUNTY—		
Gibson & Anknay, H. Harrison 1...	25	1054
Hoosier Drilling Co., W. H. Hart 2	*	935
HANCOCK COUNTY—		
W. E. Hupp, Emma Poole 3.....	25	....
J. H. Taulbee, Brown Bros. 2.....	8	540
J. C. Ellis, Link Richards 18.....	5	....
Frank Damron et al, W. E. Fuchs 2	¶.43	520
Hume, Steele & Early, Everett Bowman 4	¶.08	450
C. D. Walker et al, Cicero Phillips 1	*	588
Charles Marsh et al, Ed Bickett 1..	*	666
LEE COUNTY—		
C. G. Mays, Medley S. Cole 9.....	50	958
C. E. Townsend, Andrew Combs 7	45	959
B. & B. Oil Co., Frank Rogers 7..	3	....
McLEAN COUNTY—		
J. C. Miller, J. W. Henninger 6..	25	....
OHIO COUNTY—		
J. C. Ellis, Ada Keith 1.....	10	640
Evans, James & Hunt, Cameron Heirs	8	....
Nollem Oil & Gas Co., Marshall Lloyd 3	5	....
Porter Evans, Porter Evans 2.....	¶.53	514
Whitehouse Oil & Gas Co., Callie S. Lloyd 4	*	555

PENNSYLVANIA

Company, Well and Location	Init. Prod. Bbls.	Depth
ALLEGHENY COUNTY—		
M. Koenig, Koenig 1	*	....
GREENE COUNTY—		
Peoples Natural Gas, J. C. Wildman 1915	¶.50	3453
North East Gas Co., John McNicholas 1	¶.30	2373
POTTER COUNTY—		
French et al, George Burd 1.....¶8.00		5245
G. L. Cabot, Inc., A. Bean 1.....	*	4981
TIOGA COUNTY—		
G. L. Cabot, Inc., A. J. Pride 1...¶1.50		4981
Potter Development Co., C. Learn 1	¶.74	4105
WASHINGTON COUNTY—		
Equitable Gas Co., S. E. Reese ....¶3.00		2486
F. K. Fawcett et al, Tucker Heirs 2	40	2970
Moore, Orrill et al, J. H. Hazlett 4	20	3084
Salem Flack, Ira Baker 1.....	*	1210
I. C. Bloom et al, Clyde Hinerman 2	*	3334

NEW YORK

Company, Well and Location	Init. Prod. Bbls.	Depth
SCHUYLER COUNTY—		
Southwestern Development Co., Shearer 1	*	2340
STEUBEN COUNTY—		
G. L. Cabot, Inc., Carrie Calkins 1	¶20.00	4020
John W. Becker, C. Calkins 1....¶17.00		4007
S. J. Brendel, E. H. Ackerman 1..¶12.00		4137

ILLINOIS

Company, Well and Location	Init. Prod. Bbls.	Depth
CLAY COUNTY—		
Benedum-Trees, Inc., A. E. Valbert 1	*	3163
Pure, Oscar Poppe 4	1800	3010
Wiser Oil Company, Damon Smith 4	240	2984
Damon Smith 5	1036	2986
MARION COUNTY—		
Vermillion Oil Co., M. E. Church 1	132	1453
Cypress Oil & Gas Co., Adams 3..	85	1457
Howell 3	85	1405
H. & H. Drilling Co., C. Adams 1	35	1459
RICHLAND COUNTY—		
Pure, John Eagleson 1	110	3977
Ohio Oil, E. H. Arbuthnot 2.....	89	2968

*Failures; †Junked; ¶Million cu. ft. gas.

Thirty completions add twenty producing wells.

* * *

Two new producing areas promise of importance.

Mount Pleasant, Mich.—Thirty completions in Michigan for the week marked a new year high, with Buckeye in Gladwin County and Salem in Allegan County accounting for the bulk of new flush production. Ten failures are included in the week's completions, two being wildcats which have been

MICHIGAN
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ALCONA COUNTY—		
John Langloh's Kurrasch 1, sw sw se 10-27n-8e	*	1540
ALLEGAN COUNTY—		
Lentz & Miller's Sebright 4, se nw sw 16-4n-13w	80	1567
Red Man & Devonian's Goodman B1, se ne ne 21-4n-13w	900	1559
Allegan Crude Oil's Hardy 1, nw nw ne 21-4n-13w	1100	1602
James E. Flanigan's Brown 1, nw ne ne 29-1n-13w	12	1389
ARENAC COUNTY—		
Gordon Oil Co.'s State 1, se ne ne 2-19n-3e	*	3080
Stanley Russell's Podsiadlik 1, nw nw se 26-19n-3e	140	2043
Weber Oil Co.'s Dodge 1, nw se sw 4-20n-4e	200	2615
GLADWIN COUNTY—		
Wicklund Development Co.'s State K1, sw sw se 3-18n-1w	900	3661
Sun, Strokirch 5, nw sw sw 3-18n-1w	45	3672
Card 1, se sw nw 10-18n-1w	1000	3655
D. F. Jones' Bonnigot 2, nw nw sw 10-18n-1w	300	3650
C. W. Teater's Adametz 3, sw nw sw 12-18n-1w	500	3639
Cryden & Rowmor's Schaffer 3, sw ne sw 12-18n-1w	1430	3601
Fletcher & Rathburn's State 1, ne ne sw 14-18n-1w	100	3653
Archie M. Henry's Lincoln Life 4, sw se se 35-18n-1w	200	3600
Turner Pet. Co.'s McMahon 1, se sw se 36-18n-1w	15	3586
Gordon Oil Co.'s State C1, nw nw se, 36-18n-1w	190	3583
Petroleum Investor's Upton 4, ne ne nw 36-18n-1w	160	3607
F. C. Stover's Bushomg 1, sw se ne 16-18n-1e	*	3667
Rex Oil & Gas Co.'s Griffin 1, nw ne ne 1-17n-1w	*	3592
ISABELLA COUNTY—		
Pure Oil Co.'s Embrey B1, nw nw nw 3-14n-6w	150	3620
Rowmor Corp.'s Leiter 4, sw ne sw 33-15n-6w	425	3645
MIDLAND COUNTY—		
Consolidated Pet. Co.'s Reed 8, nw ne se 10-14n-2w	*	3564
MONTCALM COUNTY—		
Roosevelt Oil Co.'s Curtiss 1, nw nw sw 12-10n-5w	*	3251
Bushnell Oil Co.'s Stedman 1, sw nw sw 12-10n-5w	*	3196
OGEMAW COUNTY—		
McClanahan Oil Co.'s Oldham 1, sw sw se 31-21n-4e	*	2645
Wade-Stamy Co.'s Fisk 1, sw ne ne 28-22n-2e	40	2700
OTSEGO COUNTY—		
Harley William's Raae 1, se se se 15-30n-1w	*	2599
ROSCOMMON COUNTY—		
Seger & Perkins' Barnett 1, ne ne ne 36-21n-1w	*	3697

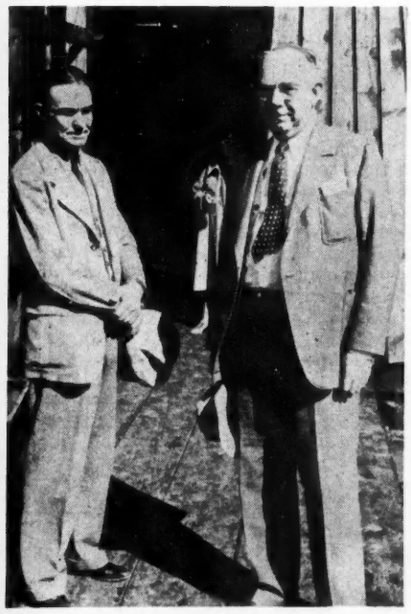
*Failures; †Junked; ¶Million cu. ft. gas.

closely watched by both major and independent operators.

Seber & Perkins are quitting Barnett 1, NE NE NE 36-21n-1w, Roscommon County, as a Dundee failure at 3697 feet. Dundee was logged structurally low at 3593 feet. The test is located about 15 miles north of the Buckeye field.

F. C. Stover's Bushomg 1, SW SE NE 16-18n-1e, Hay Township, Gladwin County, a mile east extension try of the Buckeye producing area, drilled into Dundee water at 3667 feet and is being plugged. Dundee was chalked at 3575 feet, showing the structure falling off. This failure on the east side, coupled with a Dundee failure last week on the west side apparently limits the width of the upper Buckeye field to approximately 3½ miles. Boundaries already have been established on the north and south; however, development is spreading northwest and has room for a major extension.

Harold J. Hand's Smart 1, 29-17n-2e, Bentley Township, Gladwin County, important 7-mile southeast extension test of lower Buckeye, continued in



the uncertain stage this week. With an initial showing of 1600 feet of oil at 3497 feet (Dundee top 3414 feet), the test swabbed about 100 barrels over a 10-day period. An attempt to acid treat on September 12 failed to take and it is to be retreated.

Meanwhile, two other districts of Michigan are showing for greater importance. Champion Development Company's Detling 1, SE SE SE 35-2n-13w, Allegan County, is pumping about 25 barrels daily following acid treatment at 1458 feet in the Traverse limestone. This test is 15 miles south and 4 miles east of the Salem oil field in Allegan County and 4 miles north and 3 miles east of two commercial Traverse limestone wells recently completed in Throwbridge Township of Allegan County.

Apparently confirming a pool of some importance is a northwest offset well to the discovery in Adams Township (19n-3e), Arenac County, which produced 200 barrels in 5 hours following acid. The test was S. G. Russell's Podsiadlik 1. It offsets a 30-barrel pumper drilled two months ago. Both are producing from the Traverse formation at approximately 2000 feet.

Twenty-two permits to drill were issued this week for new Michigan tests to maintain fairly high activity in the state.

What had loomed as an important south extension three months ago of the old Crystal field in Montcalm County was virtually exploded this week when two tests failed and another showed only 300 feet of oil natural. Six tests had been started in the play following two commercial wells.

Vernon-Clare gas fields have inadequate supply

Mount Pleasant, Michigan.—Rapid depletion of the gas reserves in both the Vernon and Clare fields, source of supply for Mount Pleasant and Clare, may force elimination of all industrial heating and possibly house heating units this winter.

Volume has fallen below the needed 6,000,000 feet, and reserves are now placed at less than 3,000,000,000 feet. The two cities served use about one-half billion feet per year.

Below.—Applying acid to Harold J. Hand's Smart 1, section 29-17n-2e, Bentley township, Gladwin County, seven-mile extension test of Lower Buckeye field, which swabbed 100 barrels natural at 3497 feet, 83 feet in the Dundee limestone.

Above, left, is J. M. McGilvery, in charge of production and development for the H. J. Hand group; and right, Hoyt Smart, a Bay City, Michigan, wholesale grocer, who bought the 160-acre tract on which the important wildcat is drilled as a "plaything" six years ago. The Bentley test if productive may spell new oil riches for the state treasury. Thousands of acres of state owned land surround the well on which the state retains full royalty rights.

NEW MEXICO

South Eunice pool well makes spectacular flow

Hobbs, N. M.—New Mexico development lately has been featured by a one-half mile southwest extension of the Vacuum pool, Lea County; an impressive production performance of a new well in the South Eunice field, same county; completion of 7 wells within the latest 7-day period on which reports are available; and making of locations for four new wells, each in a different field.

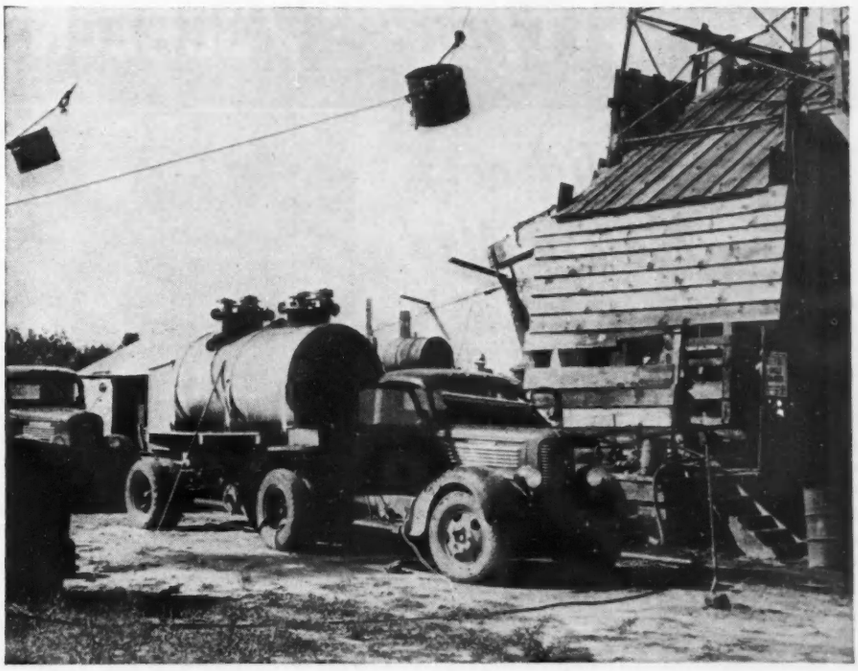
Magnolia Petroleum Company's State-Bridges 2, C SW SE Section 14-17s-34e, one half mile southwest of the Vacuum pool discovery well, is the third well of that field. The well had 3500 feet of oil in the hole when drilled in Permian lime to 4478 feet. It encountered the first pay from 4428 to 4442 feet. Seven-inch casing was cemented at 4363 feet.

The Vacuum pool discovery well was completed in July, 1929, flowing 177 barrels daily after a shot in the main lime at 4602-4900 feet.

The second well of the Vacuum area, completed last May, was Magnolia Petroleum Company's State 1-G, ¾ mile southeast of the discovery well.

The prolific well in the South Eunice area is The Texas Pacific Coal & Oil Company's State 5-A, Account No. 2, C NE NE 7-22s-36e. The well was reported to have shot a solid stream of oil over the derrick, from lime at 3780 feet, after which it was shut in to await installation of storage, another separator, and flow lines. Following cementing of 7-inch casing and subsequent drilling of plugs, the fluid had been bailed down 800 feet from the top when the well blew in. This well is a south offset to a 100-barrel an hour producer.

The 7 new wells completed in New



Mexico included an oil well in Eddy County; 2 oil producers in the Hardy field, Lea County; one gas well each in the Langlie and Mattix areas, Lea County; an oil well at Monument, Lea County; and a Lea County wildcat, west of Eunice field. These new wells appear in the accompanying completion list.

The four new locations are in the Eunice, Langlie, Lynn and Mattix pools, Lea County. The Eunice location is Two States Oil Company's R. W. Atha 1, C SW SW 31-21s-36e, near the southwest edge of the field. That at Langlie is Stanolind Oil & Gas Company's P. J. Langlie 2-A, C NW SW 9-25s-37e, offsetting oil production on the west flank of the field. The new location in the Lynn area is General Crude Oil Company and Magnolia Petroleum Company's State 2-C, SE SW SE 16-23s-36e, an east offset to one of the oldest oil producers in the area The new drilling site at Mattix pool is Stanolind Oil & Gas Company's State 1, C SE SE 16-24s-37e, offsetting production.

NEW MEXICO

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
EDDY COUNTY—		
Red Lake Co., State 9, sec 22-17-28, pumped	15	1954
LEA COUNTY (Hardy)—		
Continental, Hawks 1-A-5, c nw se 5-21s-37e	200	3760
Stanolind, E. C. Hill 1, sec 5-21s-37e	120	3760
LEA COUNTY (Langlie)—		
Stanolind, Langlie 3-B, c sw sw 14-25s-37e	¶14	3375
LEA COUNTY (Mattix)—		
Stanolind, Myers 1-B, c nw nw 7-24s-37e	¶6	3402
LEA COUNTY (Monument)—		
Stanolind, Gilluly 4-A, c nw ne 24-20s-36e	18	3875
LEA COUNTY (Wildcat)—		
J. W. Brown et al, State 1, c sw sw 22-21s-34e, w Eunice	*	4144

*Failures; †Junked; ¶Million cu. ft. gas.

Operations active in face of pending curtailment.

* * *

Start drilling in deep campaign at Salt Creek.

Casper, Wyo. — Rocky Mountain Drilling operations continued to hold steady during the past week despite a decline in operations in the Cut Bank field of Montana which has cut runs to 40 percent of normal and curtailed drilling in preparation for the winter marketing slump. Wyoming operators continued to push ahead as did other Montana producers and work was started this week on several recently staked locations.

The Kevin-Sunburst field, Toole County, northern Montana, was the most active in the area during the week, operators in that field bringing in five flowing producers and starting five new wells, leaving the number of active wells in the field at 18, the same as for the past week. The only completion reported this week for the Cut Bank field, Glacier County, was a gasser which made 10,000,000 cubic feet initial.

Wyoming operations remained more routine during the week, with the Hidden Dome field, Washakie County, showing the greatest change. Both active wells which have been drilling in this field were completed this week, one as a commercial oil well and the other as a failure. Wyoming Oil & Refining Company brought in the producer, Government 9, N½ NW NW¼ 31-48n-90w, which made 20 barrels of oil initial from the Frontier formation. Hole is bottomed in the producing sand at 1473 feet and the 8-inch production casing has been set on top of the formation at 1467 feet. The other completion was Arlt & Doyle's Government 1, SW SW SE 29-48n-91w, dry at 1632 feet.

Actual drilling started Stanolind Oil & Gas Company's Wyoming Associated Oil Company-Tensleep 11, C NE NW 35-40n-79w, first of the deep wells in the old Salt Creek field, Natrona County, to get underway in the recently opened campaign to develop the Tensleep producing sands. Wyoming Associated Oil Company - Tensleep 29, CSW SW 26-40n-79w, is rigging up rotary and will drill to the deep sand. Work will not be started on the third well for which location has been staked in C NE SW 35-40n-79w, until one of these wells is new completed.

After drilling to 7775 feet in the Big Horn lime formation without encountering any commercial oil shows, Carter Oil Company's deep test in the Billy Creek field, Johnson County, northern Wyoming, was abandoned as a failure this week. Fred Rider 3, NW SE 17-48n-82w, drilled as an oil test of the structure which produces gas. No commercial oil production has been developed on the structure although several good oil shows have been reported in flank wells.

In the Lance Creek field, Niobrara County, eastern Wyoming, Argo Oil Company reports Ford 4, SW SE 33-36n-65w, deep test in the northeastern sector of the field, drilling at 5636 feet in the Minnelusa sand. Continental Oil Company's deep test in the southeastern part of the field, Tom Bell 10, CSW NW 34-36n-65w, is making hole at 6181 feet. Both wells encountered good oil shows exceeding 12 barrels an hours on test in the upper sections of the Minnelusa sand and drilled ahead to test the lower sands of the formation. Continental Oil Company may have drilled through the Pennsylvanian beds into the Mississippian formations although official confirmation of this could not be obtained.

Along the east flank of the Lance Creek field, Ohio Oil Company's Taylor 2, OPC-32, NWC NW SW 3-35n-65w, is having difficulty in getting tester to bottom at 5611 feet, in the Minnelusa

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sand in which slight oil shows were reported. Further work on the hole is delayed pending official test. The company's Leo 1 OPC-7, NWC NW SE 35-36n-65w, is drilling at 5605 feet, and is believed to be nearing the top of the Minnelusa formation although no saturation has been encountered.

Ohio Oil Company released location for a new well in the Lance Creek field this week, and running cement for the substructure of Carrie Putnem 9, which will be drilled in NE NW 4-35n-65w.

Continental Oil Company's Sundance well in the Lance Creek field, Otta Rohlff 8, SE SE 31-36n-65w, is preparing to shoot the formation. Hole is bottomed in the Basal Sundance sand at 4025 feet and has been testing in the formation for three weeks. Several light shots have been made and operators will try again with 80 quarts. The company's Schuricht 5-B, CSW SW 5-35n-65w, Lance Creek, is making hole at 4927 feet in the red beds, headed for a test of the Minnelusa formations after encountering water in the Basal Sundance.

J. M. Huber Corporation's Joss 3, NE NE SW 6-35n-65w, recent start on the southwest side of Lance Creek, is still rigging up. Midwest 2, NE SE SW 27-36n-65w, north outpost, is drilling at 3450 feet.

Badger Basin Interest Revived

Interest in Resolute Oil Company's deep wells in the Badger Basin field, Park County, northern Wyoming, was renewed this week as Government 1, CNE NE 20-57n-101w, was reported approaching critical depth. It is drilling at 7585 feet with the producing horizon expected at around 8000 feet in the Frontier sand. The company's Northern Pacific 1, CNE NW 21-57n-101w, is drilling at 4380 feet.

Yale Petroleum Corporation was slowed slightly this week in Stock-Jones 1, SEC lot 52-56n-97w, Garland field, Big Horn County, when drill pipe stuck at 3372 feet while drilling by tools which were lost at 4050 feet. The pipe was loosened, however, and well is continuing ahead.

Ohio Oil Company has plugged Adam Pryde 1, CSW SE 24-56n-97w, Byron field, Big Horn County, to 5760 feet from old total depth at 6060 feet to test saturation encountered on the way down in the Embar lime formation. It encountered no commercial oil or gas shows in the Tensleep sand and was plugged back to the slight saturation encountered in the Embar lime which will be acidized and tested.

Ohio Oil Company's Woods 15 OPC-3, NW SE 30-58n-99w, Elk Basin field, Park County, northwestern Wyoming, is drilling at 800 feet. North Extension test of the Elk Basin field, the Henderson Producing Company's Elk 1-H-11, SE SE NW 35-9s-23e, on the Carbon County, Montana side of the field, is getting ready to run 10-inch casing to bottom at 1618 feet. It is believed to be nearing the first Wall Creek sand, the first possible producing horizon expected in the field.

Italo Petroleum Corporation is drilling at 400 feet in Phebus-Government 1, NW NW SW 11-44n-98w, northwest extension test of the Hamilton Dome field, Hot Springs County, northcentral Wyoming. Surface casing of 13-inch pipe was set at 300 feet last week. The company is also reported to be drilling its water well on the Cherokee Ridge uplift, Sweetwater County, southwestern Wyoming, ahead as an oil test. The well, which is located in SWC 36-13n-95w, reported gas shows at 70 and 150 feet and found water at 610 feet. Drilled originally as a water well for an oil test of the structure, operators may carry the well to around 1200 feet for an oil test.

The Tri-State Basin activities during the week showed Mountain Fuel Supply Company getting underway this week with its deep test of the Cherokee Ridge uplift, Sweetwater County. W. L. Williams 1, CE½ NE 5-12n-95w, spudded in to 650 feet this week and set 585 feet of 12½-inch casing. The company's deepening operation in the South Baxter Basin field, Sweetwater County, Union Pacific 1, SW SE 13-17n-104w, cemented cave in hole at 3330 feet and is waiting on cement to set. In the North Baxter Basin field, Sweetwater County, the company's Charles Stone 1, SW SW 18-19n-103w, recemented the 8-inch casing this week at 3800 feet, where well was plugged back to test the gas sands in the upper Sundance formations.

In the Clay Basin gas field, Daggett County, eastern Utah, Mountain Fuel Supply Company's Keith Smith 1, SW NE 20-3n-24e, is drilling below 2660 feet.

E. A. Ottman is recementing surface casing on bottom of hole at 930 feet in Government 1, NE SW NE 26-14n-119w, at present the only active well in Uinta County, southwestern Wyoming.

In the LaBarge field, Lincoln County, western Wyoming, Place Oil Company's 1, SE SE SE 9-36n-113w, is near completion, testing saturation encountered at 1212-1228 feet with hole bottomed in the saturated section. Production casing has been set on top of the oil shows at 1212 feet.

MOUNTAIN STATES
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MONTANA		
TOOLE COUNTY (Kevin-Sunburst Field)—		
Rice Oil Co., Anderson 1, sw sw ne 8-35n-1w	144	1738
M. W. Cassidy, Thompson 2, cse nw 2-35n-3w	*	2025
R. C. Tarrant, Barkuloo 1, cne ne 25-35n-4w	*	1955
WYOMING		
ALBANY COUNTY (Quealy Dome Field)—		
California Co., Holst 8, csw se ne 13-17n-77w	360	3875
NATRONA COUNTY (Salt Creek Field)—		
Stanolind, Tensleep 8, cnw se 26-40n-79w	211	4000
NIOBRARA COUNTY (Lance Creek Field)—		
Ohio Oil, Lamb 10, Account 2, ne se 5-35n-65w	¶1½ & 1666	5423

*Failures; †Junked; ¶Million cu. ft. gas.

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CALIFORNIA FIELDS

Union Pacific gets record gusher at Wilmington.

* * *

El Segundo has 11 rigs running; 6 to start soon.

* * *

11,100-foot test reports no shows since 10,861 feet.

Los Angeles.—Union Pacific Railway last week chalked up the record of having completed Wilmington's largest producer when Offset 20 was brought in for 7500 barrels of 25.9 gravity oil from 4090 feet. Production rose to 7700 barrels before being choked back.

Long Beach Harbor Commission has made locations for the 24 wells and will let contracts for the drilling of the wells. This action will put the city of Long Beach in the oil business, as no effort will be made to lease these parcels to oil companies.

Good Wells At El Segundo

El Segundo field, Los Angeles County, near the large Standard Oil Company refinery and near the ocean, is also coming into the lime light with good wells. The latest was Ohio Oil Company's Gough 6, which came in from 7413 feet for 3600 barrels of 27 gravity pipe line oil and 3,000,000 cubic feet of gas. The new well is located 1650 feet north and 2444 feet east from the southwest corner of Section 7-3-14, and is almost due north from The Texas Company's Security 1, good for 5000 barrels, and Standard Oil Company's Refinery 1, good for about 2700 barrels. Gough 6 cored about 70 feet of true oil sand.

Eleven rigs are running in El Segundo and there should be several new completions in 10 days. Six new projects are to get started soon.

Two Will Spud in New Field

In the Northwest Long Beach area, thought to be a new field, with a dry section between it and Long Beach proper, one well is drilling and two others are to start at once. The new area was discovered by Hilldon Oil Company's A.M.E.B. Co. 1, which is making 530 barrels of 24.2 gravity oil, with bottom at 4038 feet.

Drilling at 11,100 Feet

The deepest test in California is Kettleman North Dome Association's No. 4-18J, which is now drilling at about 11,100 feet, in gray sand with thin streaks of shale. This is an edge test for the field, but no oil sand has been found below 10,861 feet, where it tested for better than 1100 barrels a day of fairly clean oil. The hole will core deeper.

Union Oil Company's Kernco 1-34, wildcat test in Section 34-28-25, Rio Bravo area of Kern County, is coring at 10,540 feet in shale. Some 12 feet of oil sand, in streaks, were picked up after passing the 10,424-foot mark. In the Wasco area of Kern County, Continental Oil Company's K.C.L. A2, Section 8-27-24, is coring shale at 10,700 feet, but no worthwhile showings have been reported.

Union also drilled Callender 50 in Dominguez field to 10,435 feet, but had to plug back to 7574 feet, where a production test will be made. The Union also drilled Bell 100 at Santa Fe Springs to 10,789 feet, but a fishing job forced a redrill. The redrilled hole is now at 10,300 feet. Last casing was 8⅝-inch, cemented at 7427 feet.

CALIFORNIA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
DOMINGUEZ—		
Tide Water Associated, DeFrancis 14	280	4367
EL SEGUNDO—		
Republic Pet. Co., El Segundo 2..	80	7477
Ohio Oil Co., Gough 6	3600	7413
WILMINGTON—		
Bankline Oil Co., D. H. C. 22	670	3342
Royalty Service Corp., P. E. 1	300	3568
No. 16-7-2	375	3120
Union Pacific, Offset 42	200	3614
PLAYA DEL REY—		
Metropolitan Oil Co., No. 1	*	6541
KETTLEMAN HILLS—		
Kettleman No. Dome Assn., No. 28J-47	2160	8141
No. 28J-67	300	8116
BELRIDGE—		
Tide Water Associated, Reward 6..	2925	8736
FRUITVALE—		
Meridian Oil Co., Turner 5	360	3045
GREELEY—		
Standard, K.C.L. 77 11-7	4400	7815
KERN FRONT—		
Calif. Star Oil Co., No. 2-80	180	2650
MIDWAY SUNSET—		
Standard, No. 78-33D	450	3090
MOUNTAIN VIEW—		
North Am. Oil, Toplon Cons, Tupman 1	1500	5554
SANTA MARIA VALLEY—		
Union Oil Co., Cook 1	175	6710
Russell 2	1110	4457
RINCON—		
Richfield Oil Corp., Hobson U. S. 2	400	4788
MOUNTAIN VIEW—		
P. H. Greer, Pervel 1	700	5502
LOS ANGELES COUNTY—		
Metropolitan Oil Co., No. 1	*	6541

*Failures; †Junked; ¶Million cu. ft. gas.

Indications are that a new field has been proved in Santa Barbara County near Los Alamos, some 3¼ miles from the nearest production. E. C. Arnold's Apache 2, located 1650 feet south and 1650 feet east of the northwest corner of Section 8-8n-33w, with bottom at 6374 feet, was placed on the pump for nine hours and made some oil and considerable mud. Pressures started to build up, and on the second day well flowed by heads. On the third day, well was flowing about 200 barrels a day, cutting around 80 percent. Top of Monterey was encountered at 4920 feet, and the flow is through 1520 feet of perforated. Seven inch had been cemented at 4840 feet.

Greeley Outpost Produces

Standard Oil Company's K.C.L. 11-7, Section 20-29-26, in the new Greeley field in Kern County, has been completed at 7815 feet for a potential of 4500 barrels of 51.8 gravity oil, clean. It was also making 52,000,000 cubic feet of gas. The well has been shut in so heavier equipment can be installed. It is one mile east of the discovery and is on the east edge of the proven area.

Another good well of recent completion is Tide Water Associated Oil Company's Reward 6, edge test in the North Belridge field, which came in for 2925 barrels of 31 gravity oil at 8738 feet. The gas output is about 12,500,000 cubic feet. Its success probably will mean additional drililng in its area, since it proves up a lot of area.

The well is near the Long Beach Harbor boundry line, east of the Ford plant, and is the most easterly well in the Terminal area. Liner was landed at 4087 feet and cemented through perforations at 3601 feet, while tubing was run to 3601 feet. The flow is through 381 feet of perforated 6⅝-inch. The casing record of the well includes 18⅝-inch cemented at 196 feet and 11¾-inch cemented at 2508 feet. The gas production is 3,250,000 cubic feet.

Completion of Offset 20 in the second sand probably will bring about the drilling of more wells to the sand. Wilmington is producing around 56,000 barrels a day, with a large number of wells choked back.

Two petroleum engineering courses at U. of California

Two courses in petroleum engineering are being opened by the University of California extension division in Los Angeles. A course in petroleum technology was opened September 15 at 7 p.m. in Room 522 of the Metropolitan High School. Instructor will be Paul F. Devine, head of the science department at Thomas Jefferson High School in Los Angeles. A second course in oil production engineering was opened by the state university's extension division at its own classroom headquarters at 815 South Hill Street in Los Angeles the evening of September 16. Instructor in this course, which will include study of the condition of oil reservoir, drilling programs, theories of production and other pertinent subjects, will be Glen H. Bowlus, oil production engineer.

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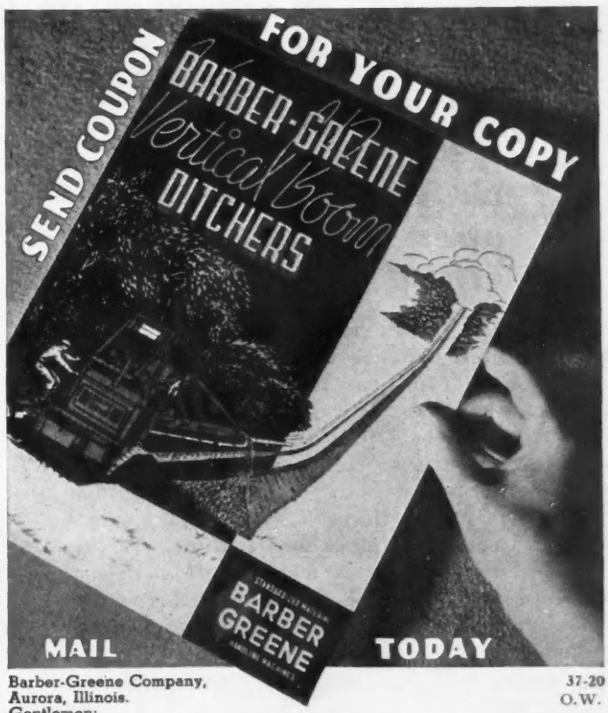

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IMPORTANT WILDCAT TESTS

ALABAMA

CHOCTAW COUNTY—Joe Modisett et al's McCorvey 1, se sw sw 20-9n-2w, elev 120 ft, top Selma chalk 1865 ft, top Eutaw 2913 ft, top Tuscaloosa 3525 ft, top upper Cretaceous marine formation 4100 ft, dr 4210 ft, hard fossiliferous shale.

GREENE COUNTY—Greene County Dev. Co.'s R. C. Lett 2, se nw 5-21n-2e, sd 115 ft.

HOUSTON COUNTY—Rice O&G Co.'s Oakley Est. 2, nw sw 9-3n-29e, sd 4975 ft.

ARKANSAS

CROSS COUNTY — Manning & Martin's Park-Gieseck 1, nwc ne ne 4-6n-5e, 10-in csg 754 ft, dr 3112 ft shale.

CLEVELAND COUNTY—J. R. Lockhart's Ida Robertson 1, 36-10-11, dry abn td 3987 ft. Hernsberger 1, se ne 16-11-13, dk.

COLUMBIA COUNTY—Standard of La's McKean 1, c sw sw 8-16-22, 9⅝-in csg 4692 ft, dr 6046 ft. Tide Water-Seaboard's C. N. Crumpler 1, nec sw 24-17-19, dr 1200 ft.

CRITTENDEN COUNTY — Stanley Oil Corp's D'Anna 1, 18-8-9, arr test so 1387 ft.

DREW COUNTY—Sloan Wells et al's Hardy 1, sec nw 3-14-7, rur.

HEMPSTEAD COUNTY—Easton, May & Murdock's R. M. LaGrone 1, ne ne 5-12-16, dr 2868 ft, hd red shale.

LONOKE COUNTY—Frank Silver's Chambers Est. 2, sw ne nw 17-2-7, sd 1500 ft. Al Demur's High 1, ne sw 25-1n-9w, sd 512 ft. Jas E. Russell's Gunter 1, 17-5-10, dk.

NEVADA COUNTY—W. E. Lokey, Tr.'s Purifoy 1, ne ne 17-11-120, sd 1630 ft. A. M. Lacey's Bennett 1, c sw ne 28-14-22, rur. Union Drlg. Co.'s R. W. Fuller 1, nec se 6-13-21, woc 10-in csg 120 ft.

OUACHITA COUNTY — Copenhaver Oil Corp.'s J. E. Evans 1, ne sw 20-11-19, elev 154 ft, co 1730 ft. Benedum & Trees Oil Co.'s G. W. Slaughter 1, nw nw 24-14-19, rur.

UNION COUNTY—E. M. Jones' Marine Oil Co. 1, 17-18-17, elev 238 ft, logged 51 ft formation so, cemtd 7-in od csg on bottom, arr test, td 7615 ft. Lion O. R. Co.'s Morgan A-1, 18-18-17, ft. Lion O. R. Co.'s Wingfield's Southern Kraft 1, sw ne 18-16-14, elev 124 ft, cored gray & green sand, no show 5197-5215 ft, coring 5223 ft. I. J. Langley's K. K. Langley 1, nw se ne 1-19-18, lcn

CALIFORNIA

KERN COUNTY

MIDWAY SUNSET—American Empire Oil Co.'s No. 1, 30-31-24, rur.

ARKELO—Arkelo Pet. Co.'s No. 41, 23-28-26, td 10,056 ft, redr at 7881 ft.

McKITTRICK—Birch-Ranch Oil Co.'s Lovitt 1, 10-30-21, dr shale 3320 ft, dips 75 degrees.

WASCO—Continental's K.C.L. A-2, 8-27-24, dr shale 10,517 ft. Seaboard-Tide Water's K.C.L. C-1, sd 10,213 ft.

ROSEDALE—Continental's K.C.L. B-1, 12-29-26, td 10,205 ft, redr, 6180 ft.

DEVIL'S DEN—Den Pet. Co.'s Bates 1, 20-25-19, dr shale 4650 ft. Geo. Goodrun's Baron 1-A, 24-25-18, sd 190 ft.

ROUND MOUTAIN—Freemont Oil Co.'s Olcese 1, 26-28-29, sd 2820 ft. Rudolph Pageman's No. 1, 10-28-29, rig. Tampico Pet. Co.'s Bass & Goodnight 3, 17-28-29, spud 9/8, dr. J. J. Tavis Olcese-Tavis 1, 4-29-29, sd 3260 ft.

ARVIN—General's Houchin 1, 27-31-29, dr shale 5983 ft.

BELRIDGE—General's St. Helens 1, 12-28-20, rig.

STRAND—Ohio's K.C.L. E-3, 14-30-25, rur.

KERN FRONT—Pacific O&G Co.'s Davidson 1, 36-27-27, dr shale 2793 ft.

GRAPEVINE—Reserve O&G Co.'s Tejon 33-2, 33-11-19, td 4505 ft, redr to 4476 ft, sd; Tejon 4, 33-11-19, td 5444 ft, plug 4607 ft, swabbed dry, sd.

ELK HILLS—Richfield Oil Corp.'s Buena Vista A-1, 7-31-25, sd 3710 ft.
91'CK,H6 shrdl cmfw vbg xzfi ,. etaoin shr

MOUNTAIN VIEW—Section Six Oil Co.'s Johnston 1, 6-31-29, dr shale 4610 ft. Union-Standard's Barnbeltz 1, 1-30-28, lcn.

FRUITVALE—Shell's Bellevue A-36-31, 31-29-27, dr brown shale 9175 ft.

KERN RIVER—Sleeper Ridge Oil Corp.'s No. 1, 15-29-28, sd 50 ft. Well Developers' Detert 1, 16-28-28, dr shale 1260 ft.

SEMITROPIC—Standard's Rodolph 2, 14-27-23, rur.

McGUNDEN—Standard's Routzong 1, 2-30-28, rur.

McFARLAND—Stone & Freid's No. 1, 34-25-25, rig.

GREELEY—Superior's K.C.L. 9, 3-30-26, dr shale 6748 ft.

SO. MARICOPA—Texas Co.'s Pioneer 1, 33-11-23, dr shale 1379 ft.

MOUNT POSO—Trico O&G Co.'s Allen 1, 20-26-28, dr shale 1675 ft.

RIO BRAVO—Union's Kernco 1-34, 34-28-25, td 10,492 ft, swabbed to 7500 ft, water, trace of oil.

MISCELLANEOUS

HUMBOLDT COUNTY—Texas Co.'s Eureka 2, 22-3-1, td 7708 ft, plug 6000 ft, flowed 6,000,000 cu ft gas, tubing plugged.

KINGS COUNTY—Ray Bisconer's No. 2, 11-24-20, sd 1650 ft. Central Cal Utilities Corp.'s Kettleman-Lakeview 3, 11-23-19, sd 1202 ft. Dudley Ridge Dev. Co.'s No. 2, 24-23-20, woc 3850 ft. Kettleman View O&G Co.'s No. 1, 9-22-19, sd 4787 ft. Tri-Counties Oil Co.'s Olson 1, 10-23-22, sd 5810 ft. Carl W. Weller's Del Sable 1, 11-23-16, lcn.

MADERA COUNTY—Seaboard's Associated-General-Gill 1, 27-12-15, dr sand streaks shale 4960 ft.

SOLANO COUNTY—Tracy Dr. Co.'s Hanson 1, 25-4-2, rur.

SAN MATEO COUNTY—Wilshire Oil Co.'s Cowell 1 (Half Moon Bay), 20-6-5, dr.

TULARE COUNTY—E. P. Jennings' No. 2, 33-23-23, dr shale 2733 ft. Amalgamated O&G Corp.'s A. O. G-3, 29-24-24, dr shale 5226 ft. Standard's Morris 1, 36-24-23, dr shale 7848 ft. Tulare Dome Oil Co.'s Tulare Dome 1, 17-21-23, sd 3120 ft.

YOLO COUNTY—Standard's P. Cook 1, 32-12-1, testing 1950 ft; E. E. Hooper 1, 32-9-1, fsh 3875 ft.

MONTEREY COUNTY—Amil A. Anderson's Hillman 1, 15-24-14, dr shale 2460 ft. California Oils' No. 2, 33-23-15, lcn.

SAN LUIS OBISPO COUNTY—Barkholder Oil Corp.'s Clay 1, 14-10-26, sd 3990 ft. Hancock Oil Co.'s Dicks 1, 30-12-33, dr shale, streaks hard shell, 1857 ft. Dorothy Leingang's No. 1, 32-10-26, sd 410 ft. A. O. Lewis' Pecho 1, 34-30-0, td 2750 ft, recemented 6⅝ in 2744 ft. Temblor Oil Co.'s No. 1, 22-31-21, td 3050 ft, washed with acid, flowed 15,000,000 ft gas, sd. Vanguard Oil Co.'s Clark 1, 26-27-14, dr water well.

SANTA BARBARA COUNTY—E. C. Arnold's Apache 2, 8-8-33, to 6374 ft, to run liner for test. Crude Oil Dr. Co.'s Crude 1, 19-9-34, sd 515 ft. Gaviota Oil Co.'s Hollister 1, 35-5-33, dr 3128 ft. Hancock Oil Co.'s Los Alamos 2, 6-732- dr gray fractured shale 5908 ft. Midwestern Oil Co.'s Midwestern L-1, 28-4-27, co 2054 ft. Nine Springs Oil Co.'s Brinkinhoff 1, 9-7-30, sd 3300 ft. O. C. Fields' Santa Rita 1, 11-7-33, dr shale 2410 ft. Tide Water Associated's Leonis 1, 3-6-33, dr brown shale 3218 ft. United Western Oil Co.'s No. 1, 16-7-30, spud 8/28, dr. Valley Oil Co.'s Chief 1, 20-9-34, sd 2315 ft. Vista Del Mar Oil Co.'s Williams 1 (Summerland), 16-4-26, td 3552 ft, milling on cutters.

SANTA CRUZ COUNTY—Elba Oil Co.'s Elba 1, 6-12-1, fsh 3860 ft.

VENTURA COUNTY—El Rio Oils' El Rio

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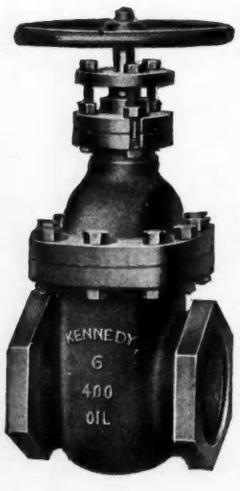

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ABBREVIATIONS

The following abbreviations, signs, etc., are used in completions and wildcat reports in THE OIL WEEKLY.

*—*dry hole abandoned well.*
‡—*salt water (completions).*
†—*junked and abandoned.*
¶—*million feet of gas.*
abd—*abandoned.*
bbls—*barrels.*
br—*building rig.*
b.s.—*basic sediment.*
csg—*casing.*
co—*cleaning out.*
dd—*drilling deeper.*
dk—*derrick.*
dr—*drilling.*
fsg—*fishing.*
ft—*feet.*
hfw—*hole full of water.*
in—*inches.*
lcn—*location.*
m—*milling.*
mim—*moving in materials.*
mit—*moving in tools.*
mot—*milling on tools.*
n, s, e, w—*north, south, east, west.*
oih—*oil in hole.*
owdd—*old well drilling deeper*
owpb—*old well plugging back.*
pb—*plugged back or plugging back.*
r—*reaming.*
rog—*rig on the ground.*
rur—*rigging up rotary tools.*
rust—*rigging up standard tools.*
sd—*shut down.*
sdtr—*sidetracking.*
sg—*show gas.*
si—*shut in.*
so—*show oil.*
so&g—*show oil and gas.*
spd—*spudding.*
sr—*straight reaming.*
sw—*salt water.*
td—*total depth.*
ur—*underreaming.*
wih—*water in the hole.*
wo—*workover.*
wocs—*waiting on cement to set.*
wosr—*waiting on standard rig.*

1, 6-1-21, td 3024 ft, pumping 20 bbls oil, 11 gravity. Oxnard Oil Co.'s Vanoi 1, 10-1-22, td 5460 ft, in shale, changing dr pipe. Seven Seas Oil Co.'s Johnson 1, 15-1-22, dr shale 1030 ft. Vaca Oil Explor. Co.'s Livingston 1, 6-1-21, testing 3814 ft. Richfield's McFarland 1, 13-2-21, dr shale 3390 ft. Texas Co.'s Pierce 1, 20-2-21, sd 4042 ft.

SOUTHERN CALIFORNIA

NEWHALL—Barnsdall's Rancho S. F. 2, 26-4-17, fsh 5090 ft. Holbrook Pet. Co.'s Newhall Land 1, 28-4-16, td 6224 ft, plug 5780 ft to test 5740 to 5780 ft. Risdon & Henderson's No. 1, 23-3-16, rig.

PICO CANYON—A. G. Burt's No. 1, 36-4-17, sd 2060 ft.

LYNWOOD—Calizoo Oil Co.'s Saulque 1, 9-3-13, td 7520 ft, plug 5800 ft, sd.

PUENTE—Simaroo Oil Co.'s Stern 1, 33-1-9, dr.

NO. LONG BEACH — Geo. L. Clayton's Clayton 1, 32-3-12, dr sand and shale 5780 ft.

FOX HILLS—Country Club Oil Co.'s No. 1, 19-2-14, sd 4986 ft.

MONTEBELLO AREA — Frank Fuller & Associates' Garvey 1, 27-1-12, lcn.

PLAYA DEL REY—Robt. C. Hall's No. 1, 22-2-15, lcn.

PALOS VERDES—Hunter-Devlin & Associates' No. 1, 17-4-14, dr sand and shale 3969 ft.

WALNUT—Julian & Criswell's Langstaff 1, 5-2-9, dr shale streaks hard sand, 2476 ft.

PALOS VERDES HILLS—McClaren Bros. No. 1, 27-4-14, td 3970 ft, redr to 1870 ft, pumping oil and water to sump; No. 2, rig.

PLAYA DEL REY—Metropolitan Oil Co.s No. 1, 34-2-15, abn 6541 ft.

CASTIAC — Royal Lands Corp.s Ramona Hills 1, 8-4-17, rig.

DEL REY-VENICE—Sharby Oil Co.s Santa Monica Dairy 2, 22-2-15, dr shale 7489 ft.

ORANGE COUNTY — Amalgamated O&G Corp.s Parr Com. 1, 22-3-9, lcn. Johnston Dr. Co.s Sunset Beach 30, 20-5-11, dr gray sand streaks sandy shale 5660 ft. Shells Harbeson 1, 9-4-10, dr shale and gray sand 5745 ft. West American Oil Co.s Irvine Ranch 1, 14-5-9, td 6070 ft, redr.

FLORIDA

LAKE COUNTY—Oil Dev. Co. of Fla.'s Gulf Explo. Co. 2, se se 17-24s-25e, elev 120 ft, arr acidize and retest at 2600 ft, old td 6126 ft.

LEVY COUNTY—Fla. Oil Discovery Co.'s Sholtz 2, sw ne 9-15s-13w, elev 25 ft, woc surf csg.

NASSAU COUNTY—St. Mary's River Oil Corp.'s Hilliard Turpentine Co. 1, nw nw se 19-4n-24e, dr 3142 ft, sandy lime.

SUWANNEE COUNTY—Wm. G. Blanchard et al's Lucy Cotton 1, se ne 35-3s-11e, elev 70 ft, fsg 22-in reamer at 60 ft.

KANSAS

BARBER COUNTY—Olson and Skelly's Elsea 1, sw se nw 27-32s-14w, dr 4155 ft. Helmerich & Payne et al's Blunk Estate 1, cse 18-34s-13w, dr 2410 ft. W. I. Southern, Inc.'s Davis 3, se se ne 24-34s-15w, 1500 ft oih, woc. Kansan Oil Corp.'s Mease 1, ne se se 27-30s-11w, rig.

BARTON COUNTY—Ralph Wixon et al's Buhrle 1, se se ne 14-16s-13w, dr 2620 ft. Armes and Vernon O&G Co.'s Persons 1, sw sw se 7-17s-13w, set 7-in 2355 ft, co. Vickers Pet. Co.'s Lucas 1, nw nw ne 16-17s-14w, set 7-in 2870 ft, co 2905 ft. C. L. Price et al's Hammeke 1, ne ne sw 12-18s-12w, 1800 ft oih. Helmerich & Payne et al's Sessler 1, sw sw se 29-20s-11w, abnd 3414 ft. J. B. Hanna et al's Luce 1, sw sw sw 21-20s-13w, abnd 3578 ft. Brouk & Nat'l Ref. Co.'s Gory 1, nw nw sw 10-17s-13w, ur 13-in 535 ft. Shell's Peterman 1, se ne se 13-16s-14w, dr 1830 ft.

BUTLER COUNTY—Rex & Morris et al's Stephens 1, sw sw se 35-23s-3e, dr 1590 ft.

CHASE COUNTY—Calif-Illinois-Kansas Oil Co.'s Hughes 1, sw nw se 13-22s-9e, 17 bbls oil and 200 bbls wtr, 24 hrs, abnd.

CHAUTAUQUA COUNTY—C. L. Brosius et al's Garrett 1, nw sw nw 26-32s-11e, td 1940 ft, pb to 1545 ft. Craft's Lagree 1, se nw ne 8-32s-12e, est 4 bbls oil per day. Robinson et al's Foster 1, sw sw sw 6-33s-12e, testing. Harrison et al's Brown 1, ne se ne 19-34s-10e, dr 390 ft. S. H. Vineard's Hughes 1, ne ne se 13-32s-12e, td 426 ft, skid 25 ft north. W. G. Buffington's Fisher 1, cwl sw nw 10-34s-9e, dr 700 ft.

COWLEY COUNTY—E. B. Shawver et al's Fee 1, nw ne se 3-30s-4e, swb down, est 25 bbls oil daily. Pryor & Lockhart's Brown 1, ne se se 34-33s-3e, dr 610 ft. G. M. Smith and C. L. Price' Henderson 1, sw sw sw 25-32s-6e, lcn.

EDWARDS COUNTY — Douglas & Gears' Meade 1, se se nw 35-25s-16w, dr 4380 ft.

ELLIS COUNTY—Earl Wakefield et al's Burnett 1, nw nw ne 1-11s-18w, fsg 3199 ft. Billings' Smith 1, se se nw 14-12s-16w, 4000 gals acid, no incr. Western Kansas O. & Ref. Co.'s Schmeidler 1, nw nw nw 22-12s-17w, abnd 3700 ft. Lario O&G Co.'s Ball 1, nw nw ne 8-12s-18w, dr 1405 ft. P. G. Reynolds et al's Karlin 1, nw nw nw 13-12s-18w, co 1845 ft. Skiles et al's Jensen 1, sw se ne 26-12s-18w, co 2643 ft. Colonial Oil Co. and Bernheimer's Allbert 1, sw sw ne 31-12s-18w, fsg 1260 ft. L. M. Reynolds et al's Polcyn 1, se se ne 24-13s-16w, fsg 2310 ft. Brunson Drlg. & Glimac Oil Co.'s Weisner 1, se sw se 31-13s-17w, set 8-in 2815 ft, co. Aylward Prod. Co. et al's Berens 1, se se

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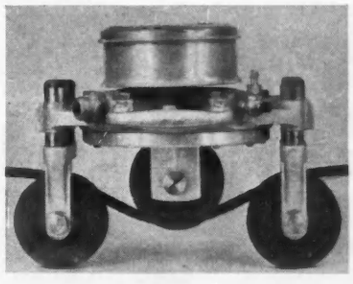

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se 10-14s-16w, spd, sd. Buffalo Oil Co.'s Phillips 1, ne ne ne 18-14s-16w, core 3435-46 ft, rec 8½ ft lime, 60 percent sat.

ELK COUNTY—Coronado Oil Co.'s Atkinson 1, sw ne sw 22-29s-10e, dr 1400 ft.

ELLSWORTH COUNTY—Equity Gas Co. et al's Razac 1, ne ne se 31-15s-10w, ur 7-in 3002 ft. Colonial Oil Co.'s Hogy 1, nw nw sw 16-16s-10w, mim. Hinkle et al's Alden 1, se se sw 17-17s-10w, br. Hinkle et al's 1-A, ne ne se 17-17s-10w, cel.

GRANT COUNTY — United Prod. Co.'s Blake 1, csw 21-30s-36w, co 2497 ft. Panhandle Eastern P. L. Co.'s Taggertt 1, C sec 11-30s-37w, testing.

GRAY COUNTY—P. G. Reynolds' Watkins 1, csw 32-28s-28w, ru.

GREENWOOD COUNTY—Ward McGinnis et al's Henley 1, sw sw sw 25-25s-9e, set 6-in woc. Eagle Oil Co.'s Stine 1, ne ne se 13-28s-10e, ru mach. S. Can Devanter et al's Dover 1, ne se sw 12-28s-11e, dr 615 ft.

JACKSON COUNTY—Lemmick Oil Co.'s Marble Savings Bank 1, cne ne 26-9s14e, rig.

KEARNEY COUNTY—J. L. Murphy's Masonic Home 1, cne 1-26s-36w, set 8-in 1465 ft, co.

KINGMAN COUNTY — Carter's Davis 1, ce½ ne ne 24-28s-8w, dr 2830 ft.

LOGAN COUNTY—Morgan, Flynn, Cobb et al's McMillan 1, cnw 9-13s-37w, sd 3489 ft.

LYON COUNTY—Davis & Sory's Davis & Sory 1, sw sw se 32-21s-11e, p 45 bbls oil and 45 bbls wtr, 24 hrs.

MARION COUNTY — Hutchinson O&G Co.'s Ehrman 1, se se sw 15-18s-1e, set 6-in 3211 ft, co. Western Kan. O. & Ref. Co.'s Suderman 1, se sw nw 22-20s-2e, fsg 2947 ft.

McPHERSON COUNTY—C. E. Ash Drlg. Co.'s Broman 1, ne ne nw 19-17s-4w, dr 2290 ft. Wamhoff et al's Nuse 1, se ne sw 18-18s-4w, sd 1850 ft. Fred C. Frank et al's Doles 1, ne nw ne 12-19s-1w, sd 2775 ft. Clyde Pulse et al's Boesker 1, se se nw 29-20s-1w, rig. C. R. Craft et al's Barnholt 1, sw sw se 30-20s-5w, P. 26 bbls oil, 2½ hrs. Boyle & Grossman's Diener 1, se se ne 35-19s-1w, dr 45 ft.

MEADE COUNTY—Pacific Mid-West Oil Co.'s Rexford 1, ne se sw 8-30s-29w, dr 200 ft.

MITCHELL COUNTY—Geo. Siedhoff et al's Greiss 1, nw sw se 16-8s-10w, sd 4022 ft.

NESS COUNTY—Newton Dev. Co. et al's Tenny 1, nw nw se 19-18s-25w, sd 4406 ft. Jones & Lane' Page Milling Co. 1, se se nw 36-18s-26w, dr 1533 ft.

OSBORNE COUNTY — J. E. Waldron's Neuschwanger 1, se ne nw 11-8s-14w, spd, sd. Fred C. Chaddox & Atlantic's Slater 1, ne sw ne 33-10s-15w, dr 2390 ft. F. E. Fullerton & Son's Moray 1, ne se sw 27-10s-12w, woc.

PHILLIPS COUNTY—C. W. Davidson et al's Ellif 1, se ne ne 35-5s-18w, co 280 ft.

PRATT COUNTY — Atlantic, Empire and Skelly's Runyon 1, sw nw ne 11-27s-13w, dr 4410 ft. Skelly et al's S. B. Adams 1, se nw ne 2-28s-11w, sd 3821 ft. Stanolind's Hartsell 1, nw nw sw 14-26s-12w, rur.

RENO COUNTY—Sam Schneider et al's Kroecker 1, ne ne ne 12-22s-5w, sd 1565 ft. Butler & Street's Kincaid 1, ne ne nw 13-24s-4w, rig. Carey et al's McPheeters 1, ne ne nw 22-26s-8w, spd, sd. W. E. Witt et al's Fair 1, nw se se 4-22s-8w, fsg 2425 ft. Cohen et al's Teter 1, se se sw 3-23s-5w, rig.

RICE COUNTY—Gillespie et al's Strong 1, ne ne nw 9-18s-8w, spd, sd. John Hanna et al's Marshall 1, ne nw nw 30-18s-8w, sd 1515 ft. Bridgeport et al's Habiger 1, nw nw nw 5-18s-10w, 4027 bbls oil, 24 hrs, comp. Skiles et al's Campbell 1, se se ne 28-19s-9w, dr 2175 ft. H. V. Holland et al's Brothers 1, se se se 12-21s-7w, 126 bbls oil, 6 hrs. Gergrand-Pulse Oil & Drlg. Co.'s Wellman 1, sw sw sw 22-21s-9w, dr 2230 ft. Oread Oil Co.'s Erion Estate 1, nw nw nw 34-21s-7w, lcn. Bell O&G Co. et al's Timbers 1, nw nw ne 8-21s-8w, rig. Elbar Corp.'s Ehlers 1, ne ne se 8-21s-9w, rig.

ROOKS COUNTY—W. W. Kiskadden et al's Ham 1, sw sw nw 25-7s-19w, ru. Graham et al's Fike 1, sw sw sw 9-9s-17w, td 3326 ft, co. C. R. Craft et al's Ziegler 1, ne ne sw 8-10s-16w, set 8-in 2860 ft, co. J. H. Lester's Methany 1, se se ne 29-20s-10w, co 3875 ft.

RUSH COUNTY—Wakefield et al's Zimmerman 1, se se sw 7-16s-18w, dr 2725 ft. Wakefield & Brouk's Kerbs 1, nw nw se 11-17s-16w, rig. Westgate-Greenland Oil Co.'s Hagerman 1, ne ne ne 20-19s-16w, abnd 4030 ft.

RUSSELL COUNTY—H. C. Eisenhour et al's Krouse 1, se se nw 18-13s-12w, spd, sd. Empire and Texas Co.'s Boxberger "B" 1, ne ne ne 23-13s-15w, dr 1990 ft. Park's Opdycks 1, sw sw sw 20-14s-13w, ru. Emrichs et al's Anderson 1, ne se sw 33-15s-11w, spd, sd. Shell's Batt 1, se se se 33-15s-14w, 1275 bbls oil, 24 hrs, comp. Cities Service et al's Eichman 1, csw sw se 12-15s-14w, dr 1285 ft. Phil-Han Oil Co.'s Deines 1, ne ne nw 33-14s-14w, mim. Trapp Drlg. & Ramsey's Polcyn 1, ne ne se 34-14s-15w, br. Murfin & Vernon O&G Co.'s Pearson 1, ne ne ne 31-15s-15w, cel. Parks et al's Gorham 1, sw nw ne 35-15s-15w, cel.

SEDGWICK COUNTY—Home Stake Royalty Co.'s Roy McCormick 1, sw sw nw 23-25s-3w, abnd 4150 ft. Roxana Drlg. Co. et al's Woodman 1, sw nw sw 26-26s-1w, sd 2469 ft. Nat'l Ref. Co.'s Fee 1, se ne se 36-27s-2e, dr 566 ft I. W. Murfin et al's Martin 1, se se nw 32-28s-1e, ur 12-in csg 1115 ft. W. C. Talbott et al's Downs Estate 1, se se nw 32-28s-2e, recementing. Palmer Oil Corp.'s Royal 1, ne ne ne 15-28s-1w, sdo 3899 ft. Union O&R et al's Howell 1, sw sw sw 6-29s-1e, ur 12-in csg 1202 ft. Fulton et al's Fee 1, ne ne se 35-28s-1e, co.

SHERMAN COUNTY—R. E. Parrish' Pizzel 1, ne ne se 15-6s-42w, rig.

STAFFORD COUNTY—Newman & Winemiller's Sittner 1, ne ne ne 33-21s-12w, 1408 bbls oil. W. P. Faulkner's Moses 1, nw nw sw 9-22s-13w, dr 715 ft. Stanolind et al's Hartnett 1, nw nw se 23-24s-11w, testing. Kessler O&G et al's Jenkins 1, se se ne 15-25s-12w, dr 2000 ft. E. J. Shaffer's Spencer 1, nw nw sw 3-25s-14w, dr 3795 ft.

SUMNER COUNTY — W. M. McKnab's Blair 1, sw sw sw 7-30s-1e, dr 3340 ft. R. J. Wixon's Newton 1, se se se 21-30s-2e, dr 1770 ft. Magnolia's Baird 1, sw se se 2-30s-4w, brr.

TREGO COUNTY—Phillips' Trego 1, cne nw 14-12s-23w, cem cave 3826 ft. Central Commercial Oil Co.'s Locker 1, csw 12-14s-22w, set 12-in csg 122 ft, woc. F. L. Thorn et al's Koeppen 1, se se sw 31-14s-24w, fsg 4355 ft. Thurman Hill et al's Lawson 1, sw sw nw 7-14s-22w, rot rig. R. E. McNely et al's Hille 1, cse ne 22-15s-24w, lcn.

WALLACE COUNTY—H. F. Wilcox O&G Co.'s Parker 1, se se ne 9-11s-40w, rur.

WOODSON COUNTY—Ward McGinnis et al's Smith & Jobes 1, nw nw se 10-24s-15e, td 1633 ft, gso and woc. Fredd Rapp's Hourland 1, nw nw se 2-25s-15e, dr 1520 ft. Becker Bros.' Vann 1, cnw nw sw se 22-25s-14e, running 6-in csg 1100 ft. Seibel's Kerschner 1, cnl ne ne 3-26s-15e, dr 1489 ft. Steinle's Kash 1, se se se 4-26s-15e, dr 1570 ft.

SOUTH LOUISIANA

ACADIA PARISH—W. C. Daniel's Setting 1, Trilby area, 17-9s-1w, sd 5106 ft. Humble's Federal Lank Bank 1, North Crowley area, 34-8s-1e, woc 8260 ft; same operator's Sarver 1, South Crowley area, 35-10s-1e, dr shale 5320 ft. Magnolia's Duson 1, Iota prospect, 14-8s-2w, ru. J. G. Markley et al's Daigle Farm 1, Churchpoint area, 19-7s-2e, dr shale 4197 ft.

CALCASIEU PARISH—D & D Oil Co.'s Lutcher Moore 2, nw of Starks, 1-8s-13w, waiting on 9⅝-in csg 8340 ft.

CAMERON PARISH — Humble's Miami Corp. 1, Premo area, 8-14s-5w, dr sand 211 ft. Pure's State Mallard Bay 2, Mallard Bay prospect, 14-13s-3w, dr shale 8105 ft. Superior's Gulf of Mexico 1, in Gulf of Mexico, 4-15s-8w, dk.

EAST BATON ROUGE PARISH—Cavalier's Elliott 1, n of Hope Villa, 3-8s-2e, washing 6157 ft.

EVANGELINE PARISH — Continental's Tate 1, Villa Platte area, 44-3s-2e, testing 9100 ft.

IBERIA PARISH—Jefferson Lake Oil Co.'s Lake Peigneur 414, Jefferson Island dome, 12s-5e. pb 6500 ft. Texas Co.'s State Vermilion Bay 2-B, in Vermilion Bay, 20-15s-6e, dr shale 3469 ft.

JEFFERSON PARISH—Triangle Oil Co.'s Carroll 1, 125-12s-11e, washing 3501 ft.

JEFFERSON DAVIS PARISH—Union Sulphur's T. R. S. Farms 1, South Roanoke area, 23-10s-4w, testing 8600 ft.

LAFOURCHE PARISH—Amerada-L. L. E.'s South Coast 1, Raceland area, 34-15s-19e, dr shale 6019 ft. Gulf's State PP 3, Timbalier Bay, 36-23s-21e, woc 6971 ft.

LIVINGSTON PARISH—Neville & Grubb's Evans 1, Mallet Bluff area, 47-7s-3e, abn 7656 ft.

PLAQUEMINES PARISH—Gulf's State QQ 3, Quarantine Bay, 17-19s-17e, woc 5204 ft.

ST. BERNARD PARISH—Southern Sulphur Co.'s State 2, Lake Borgne, 38-14s-15e, sd 3448 ft.

ST. JAMES PARISH—Continental's Realty Operators 1, Hester dome, 17-12s-5e, dk.

ST. MARTIN PARISH—Texas Co.'s St. Martin Land 10, Henderson dome, 15-8s-7e, fsh 5360 ft.

ST. MARY PARISH—Petroleum Heat & Power Co.'s Parro 1, nw of Charenton, 9-13s-9e, lcn. Texas Co.'s State Bateman Bay 1, South of Morgan City, 21-16s-12e, dr shale 10,960 ft.

TERREBONNE PARISH — Barnsdall Oil Co.'s Dibert, Starks and Brown 1, n of Gibson field, 110-16s-15e, dk.

VERMILION PARISH — Continental's Brookshire 1, Abbeville area, 66-12s-3e, dr shale 11,736 ft.

NORTH LOUISIANA

BIENVILLE PARISH—DeSoto O&G Co.'s Wm. Ashley 2, c sw se 15-16n-10w, mim. Hunt & Seaboard's Commercial Bank 1, c ne nw 3-16n-6w, elev 241 ft, massive anhydrite 5270-5510 ft, saturation 6736-76 ft, woc 7-in csg, td 6801 ft.

BOSSIER PARISH—L. W. Dennis' D. T. Roos' 1, sw nw nw 13-19n-12w, rur.

CADDO PARISH—W. J. Hunter et al's N. B. Stoer 1, nw sw ne 10-15n-15w, elev 257 ft, perf csg 5100-20 ft, showed gas and sw, pulling liner to re-set packer to shut off water, old td 6562 ft. Prairie River Synd.'s Hutchinson 1, sw nw 15-15n-12w, elev 153 ft, top lower Marine 8380 ft, top Bodcaw sand 8775 ft, coring 8976 ft.

CONCORDIA PARISH—E. A. Addy et al's Pasternack 1, c nw sw 49-8n-9e, spd and sd.

CLAIBORNE PARISH—J. R. Bevill et al's Alex Edmons 1, ne ne 16-20n-5w, elev 160 ft, pumped and flowed by heads, installing new pumping unit, td 5413 ft. Hal Compton's T. M.

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Kilgore 1, ne ne 12-20n-5w, mim. J. B. Bond's Burgess 1, ne se ne 3-20n-5w, elev 276 ft, 5¾ in csg 5276 ft, pb to 5325 ft, acidized and swabbing some oil, old td 5800 ft. Lyons & Neely's Simms 1, c ne ne 32-20n-5w, spd, dr 1120 ft. W. L. McClanahan et al's J. T. Lewis 1, sw se 25-20n-7w, rur. United Gas' Stevenson 1, se sw se 6-19n-5w, dr 5400 ft shale. Brownfield 1, nw ne 6-19n-15w, coring 4638 ft. Hollyfield & McFarlane's H. W. Patton 2, nw ne ne 2-20n-5w, mim.

DE SOTO PARISH—Pullman Oil Co.'s J. W. Ramsey 4, ne se nw 36-11n-11w, tested sw sd 2934 ft. Clear ILake Oil Co.'s J. A. Woolums 1, nw nw 29-12n-12w, dr 1705 ft.

FRANKLIN PARISH — Tensas Delta Oil Corp.'s Woodland 1, se nw se 22-11n-9e, sd 6500 ft.

LINCOLN PARISH—Burford et al's P. N. Hanna 1, w½ se 34-18n-4w, elev 269 ft, dr 6330 ft, lime & shale. T. L. James & Co.'s Spencer 1, c w½ ne 11-17n-4w, elev 365 ft, massive anhydrite 4892-5200 ft, tested est 15 mil ft gas and 10 joints mud in 15 minute drill stem test 6340-6619 ft, missed 3 other drill stem tests, sd 6619 ft. Ludel Oil Co.'s Gill 1, c ne ne nw 36-20n-2w, elev 249 ft, massive anhydrite 3698-3945 ft. dr 4560 ft shale. E. H. Moore's Commercial Bank-Williams 1, nw nw 22-18n-5w, sd 600 ft for water. Gigantic Oil Co.'s R. L. Sanderson 1, nw se nw 30-18n-1w, sd 60 ft cur titles.

RED RIVER PARISH—Whitehurst et al's LeLong 1, ne nw ne 25-12n-11w, woc 250 ft. W. J. Hunter's Long-Bell Lbr. Co. 1, sw nw 20-13n-9w, tested 4 joints oil, 2 of sw 3650 ft, dr 3990 ft shale.

SABINE PARISH — E. Howard's Sabine Lbr. Co. 1, ne nw 24-9n-12w, ru and sd. Romine et al's La. Long Leaf Lbr. Co. 1, sw sw 7-5n-12w, woc 12½ in csg 92 ft. Odell Hinson's Long-Bell Lbr. Co. 1, 5-8n-13w, acidized flowed short time, hfo, wosr, td 1811 ft.

UNION PARISH—Joe Modisett's Frost Lbr. Co. 1, ne sw 14-21n-1e, rur (7000 ft test).

WEBSTER PARISH—V. L. Foster's J. M. Mixon 2, c se se 21-21n-10w, dr 3192 ft. Magnolia Pet. Co.'s Aarnes-Cox 4, sw ne ne nw 22-21n-10w, elev 196 ft, woc 9⅝ in csg 5855 ft. Ohio Oil Co.'s Bodcaw Acct. 2, 47, c sw se 15-21n-10w, elev 200 ft, dr 7650 ft. S. P. D. Coyle & W. Cox 1, c sw se 23-21n-10w, elev 211 ft, dr 6395 ft shale; T. Crichton 1, Acct 2, c se ne 21-21n-10w, elev 217 ft, dr 7800 ft; R. L. Holloway B-7, c sw ne 23-21n-10w, elev 196 ft, dr 7450 ft; D. W. Merritt 1, c sw sw 14-21n-10w, elev 189 ft, dr 6275 ft. A. G. Oliphant et al's Sam Banks 1, c ne ne 34-21n-10w, elev 196 ft, dr 7236 ft, sand and shale. Standard of La.'s Davis 7, c ne nw 23-21n-10w, elev 196 ft, dr 5650 ft shale. Mrs. M. E. Gray 2, c ne nw 26-21n-10w, elev 237 ft, dr 5650 ft. United Gas' J. M. Mixon 2, nw sw 22-21n-10w, lcn; J. H. Tillman 6, ne ne 28-21n-10w, lcn. Woodley Pet. Co.'s R. R. Cox B-2, sw sw 23-21n-10w, elev 229 ft, dr 7010 ft; Gray B-5, sw ne 27-21n-10w, rur.

MICHIGAN

ALLEGAN COUNTY—E. L. Andrews' Perrigo 1, 28-2n-13w, dr 400 ft. Champion Dev. Co.'s Detling 1, 35-2n-13w, oil-gas 1458 ft, testing; Young 1, 26-1n-12w, dr 1240 ft.

ARENAC COUNTY—Joe Zucker's Reed 1, 10-19n-5e, dr 1900 ft. Harvey Linabury's Smith 1, 17-19n-6e, sd 2070 ft.

BAY COUNTY—Charles Weller's Dewyer 1, 20-16n-3e, rig. Victory Pet. Co.'s Lokowski 1, 27-14n-3e, dr 1100 ft.

GLADWIN COUNTY—H. J. Hand's Smart 1, 29-17n-2e, treated 1000 gallons acid Sept. 13, testing, swabbed 100 bar 6 days, td 3497 ft. Pollack-Gordon's Delbridge 1, 1-17n-2e, dr 1300 ft. Mammoth Prod. & Ref.'s Nunn 1, 18-17n-2w, dr 2560 ft. D. E. Hughes' Cox 1, 12-19n-2w, co 1450 ft. C. E. McLaughlin's Simmons 1, 28-19n-2w, sd 290 ft. Whitehill et al's Bosley 1, 11-19n-1e, dr 180 ft. Dapar Oil Co.'s Villeneuve 1, 4-20n-2w, fsg 1450 ft.

ISABELLA COUNTY—C. E. Weller's Cotter 1, 11-15n-5w, dr 1900 ft. Boston Oil & Gas Co.'s Fox 1, 23-15n-5w, sd 2610 ft. James A. Peirce's Herman 1, 4-16n-3w, sd 1367 ft.

MECOSTA COUNTY — McHardy Synd.'s Gingrich 1, 12-15n-7w, acidized 500 gallons, testing so, 3864 ft.

NEWAYGO COUNTY — Midstates Corp.'s Eichenberger 1, 7-16n-11w, lcn. Muskegon Dev. Co.'s Carlson 1, 9-16n-12w, fsg 3168 ft.

CASS—Wayne Oil & Gas Co.'s Gebhard 1, 34-5s-15w, dr 990 ft.

CHEBOYGAN—Bert Francis Tr.'s Campbell 1, 7-34n-1w, sd 500 ft.

CLARE—McClanahan Oil Co.'s Mortenson 1, 9-18n-5w, fsg 1760 ft.

CLINTON—J. T. Norris' Sturdivan 1, 36-7n-2w, lcn.

CRAWFORD—Dome Oil Co.'s Lindgren 1, 33-25n-3w, spd.

EMMETT—Cheboygan Oil Co.'s McPhee 1, 15-35n-4w, sd 650 ft.

GRATIOT—Redman Oil Co.'s Creaser 1, 18-11n-2w, dr 350 ft.

IOSCO—Pabst Pet. Co.'s Monfort 1, 8-22n-6e, dr 3410 ft.

MIDLAND—Mammoth Prod. & Ref.'s Penny 1, 9-16n-2w, dr 1430 ft.

MISSAUKEE—Rex Oil Co.'s Meekoff 1, 30-21n-6w, dr 3830 ft.

MONTCALM—Superior Drilling Co.'s Hansen 1, 31-10n-7w, rig.

OTSEGO—Barton & William's Yuill 1, 9-32n-3w, dr 400 ft.

SAGINAW—Doran & Hilliard's Dobs 1, 33-11n-1e, sd 3030 ft.

SANILAC—T. H. Ferguson's Obee 1, 17-14n-14e, sd 550 ft.

TUSCOLA—C. W. Spaulding's Dalrymple 1, 35-10n-7e, sd 2550 ft, hfw.

MISSISSIPPI

CALHOUN COUNTY—B. G. Dowell's H. D. Hughes 1, 18-23n-9e, dr 1235 ft, lime. Ed Spencer's J. C. Conner 1, se ne 12-24n-8e, mim.

FRANKLIN COUNTY—Fred E. Courson et al's Homochitto Lbr. Co. 2, 300 ft n c 18-5n-3e, dk.

KEMPER COUNTY—R. A. Keaton et al's Buckwalter Lbr. Co. 1, nec 6-10n-14e, dk.

LAMAR COUNTY—Sun Oil Co. et al's Mrs. Kate Talley 4, se nw 33-4n-15w, rur. South Miss. Oil Co.'s Morris 1, sec 4-2n-14w, dk.

PIKE COUNTY — Acadian Prod. Corp.'s Bales 1, c se nw 24-7n-2e, dk.

WILKINSON COUNTY—Chas. Green et al's Julian Taylor 1, 4-3n-1e, elev 251 ft, arr make drill stem tests td 4035 ft, Minden limestone.

YALABOUSHA COUNTY—Acme Holding Co.'s S. D. Boyle 1, nw nw 33-25n-7e, rur. Skuna Dev. Co.'s Mrs. T. A. Turner 1, se sw ne 25-25n-6e, hole clean, arr deepen 906 ft

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MONTANA

CHOUTEAU COUNTY — Security Petroleum Corporation's Johnson 1, ne 23-26n-3e, dr 1400 ft.

FALLON COUNTY—Johnson-Burke's Government 1, se ne se 6-8n-59e, dr 1200 ft.

GLACIER COUNTY—W. E. Ullman's Allotted 1, csw 35-37n-3e, dr 3438 ft.

HILL COUNTY—Nadeau Bros.' O'Neal 1, nwc 34-32n-17e, dr 1300 ft.

JUDITH BASIN COUNTY—Hunt et al's 3, nw se ne 30-14n-15e, dr 1700 ft.

PARK COUNTY—Ben W. Ryan's Burgess 1; se sw nw 28-2n-11e, dr 830 ft.

PETROLEUM COUNTY—O. B. Canfield's Government 1, cel se ne 21-17n-24e, dr 750 ft.

TOOLE COUNTY—Model Oils, Ltd.'s Fey 1, cne sw 5-37n-3e, fsg underreamer lugs at 2100 ft.

YELLOWSTONE COUNTY — Broadview Dome Oil Co.'s Halbritter 1, se nw 18-3n-24e, dr 2670 ft.

OKLAHOMA

ADAIR COUNTY—B. L. Maddox's Penn Mutual Life Ins. Co. 1, cs½ ne nw 5-16n-24e, dr 260 ft.

ATOKA COUNTY—A. L. Larson's Mason 1, sw se se 35-1n-14e, dr 180 ft. C. M. Sheldon & Gardner Pet. Co.'s Lee 1, ne nw sw 2-4s-10e, sd 267 ft. Hagey et al's Becker 1, cne 4-1n-13e, lcn; Peck 1, cne 6-1n-13e, lcn.

BECKHAM COUNTY — Mid-American Oil Co.'s Biscoe 1-A, sw sw sw 28-8n-22w, ur 6⅝-in csg.

BRYAN COUNTY — Southern Oil Co.'s Henry 1, cnw ne 10-8s-7e, lcn.

CADDO COUNTY—Clyde Becker et al's Pharris 1, se se nw 24-6n-4w, sdo 6235 ft. I.T.I.O. Co.'s Dome-Bo 1, cne se 29-6n-10w, dr 2920 ft.

CLEVELAND COUNTY—Harper & Turner's Pollock 1, cw½ nw nw 13-9n-2w, lcn. Hollenback's Norman 1, nw nw ne 17-9n-2w, dr 6870 ft. Hollenback's Ward 1, sw se ne 30-7n-1e, cor 6916 ft.

CHOCTAW COUNTY—V. K. Chapman & Low's Hallum 1, nw nw ne 4-7s-20e, mach.

COAL COUNTY—Phillips' Beck 1, se sw sw 6-1n-9e, dr 3204 ft. Carter Oil Co.'s Claytor 1, cw½ ne sw 27-2n-9e, dr 5730 ft.

COMANCHE COUNTY—J. W. Wolf's Costinus 1, sw sw se 30-4n-11w, spd. Frank Scott's Kuntz 1-A se ne se 27-4n-11w, sd 2800 ft. Andrichak's Korthouse 1, nw ne sw 33-2n-18w, td 1095 ft; 2,000,000 cf gas & so; to test.

COTTON COUNTY—Bowers & Wise's Pendergraft 1, nw se sw 4-4s-12w, der.

CREEK COUNTY—M. W. Mosier et al's Holcomb 1, se sw ne 19-18n-8e, sd 3009 ft. L. B. Jackson's Alberty 1, ne ne nw 25-18n-9e, dr 2966 ft; 500 ft oih.

GARVIN COUNTY—Carter's Potts 1, ce¼ se nw 36-1n-3w, dr 2203 ft. B.C.D. Edwards' Clark 1, ne ne ne 16-3n-3e, fsh 3320 ft.

GRADY COUNTY—Gulf's Thomas 1, sw nw nw 14-4n-5w, dr 7215 ft. Doyle Pet. Co.'s Huffine 1, nw nw se 30-5n-8w, dk.

GRANT COUNTY — Carter's Crisman 1, cw½ sw nw 16-25n-3w, si to run tubng with packer.

GREER COUNTY — J. I. Medlin et al's Broudie 1, nw nw nw 5-6n-20w, ru, sd.

HASKELL COUNTY—Continental's Ferguson 1, sw se ne 33-8n-20e, td 6740 ft; to core.

HUGHES COUNTY—Carter et al's Hamilton 1, cw½ ne sw 33-4n-9e, 60 bbls oil, 19 hrs & 15 percent wtr; comp. Phillips' Becker 1, ne nw sw 8-5n-10e, dr 2260 ft. H. H. Ellis' Tiger 1, nw se sw 29-6n-8e, sd 550 ft. W. O. Allen et al's Barnard 1, sw sw sw 24-8n-8e, reshot w/20&60 qts, no incr. Texas Co.'s Cox 1, ne nw nw 23-9n-8e, abnd 4064 ft. Moroney & Healey's Field 1, cnw sw 11-9n-11e, hfw 3540 ft, sd. E. H. Moore's Buck 1, cnw sw sw 21-8n-10e, dr 4025 ft.

JACKSON COUNTY—Ace Gutowsky et al's Booker 1, nw nw nw 33-2n-18w, sd for 6-in csg; Lee 1, nw nw se 36-2n-19w, lcn. Ace Gutowsky's Howard 1, ne sw nw 10-3n-19w, sd 950 ft.

JEFFERSON COUNTY—Massad & Swansberger's Barrett 1, ne se se 14-6s-6w, rur.

JOHNSTON COUNTY—Patton et al's McCrummens 1, sw sw ne 16-1s-6e, sd 1165 ft. W. T. Shelton's Chapman 1, cnw nw 26-4s-6e, sd 1440 ft.

KAY COUNTY—Fortuna Oil Co.'s Harris 1, sw sw ne 14-25n-1e, sd 383 ft.

KIOWA COUNTY—E. L. Lippert's Miller 1-A, nw nw nw 14-2n-18w, fsg 713 ft. Kiowa Oil Corp's Finder 1, csw ne 4-6n-20w, sd. Hughes & Reese's Fultz 1, se se se 10-6n-18w, td 768 ft. H. L. Wirick et al's Noske 1, se se nw 1-6n-17w, sd 705 ft.

LATIMER COUNTY — Clark Drlg. Co.'s Wilson 1, csc se 15-5n-18e, to test 2700 ft.

LINCOLN COUNTY — Continental's Community 1, nw nw se 7-15n-5e, dr 2635 ft.

LOGAN COUNTY—Anthony & Marshall's Fruin-Eckman 1, se se sw 4-16n-1e, sd 4975 ft. Sunray & Olson's Canning 1, sw sw ne 31-17n-1w, dr 4020 ft.

MAJOR COUNTY—Ed Parsons' Patzkowsky 1, cnw¼ 10-20n-11w, rig.

MARSHALL COUNTY—Paul Robb et al's Vittitoe 1, cne se 11-5s-4e, sd 720 ft.

MURRAY COUNTY—Power Oil Co.'s Lancaster Trust Co. 1, csw ne 10-1s-2e, dr 3755 ft. O. O. Owens' Fryer 1, ne se ne 34-1s-3e, sd 2574 ft. Meyer & Greenup's Arbuckle Royalty Co. 1, nw nw ne 18-2s-3e, sd 48 ft.

MUSKOGEE COUNTY—F. E. Cusack's Elliott 1, cnl nw sw 20-15n-20e, rog. Cusak's Fee 1, ne sw se 20-15n-20e, spd 65 ft.

NOBLE COUNTY—Seaboard Western Oil Co.'s Guthrie 1, nw nw ne 6-20n-2w, dr 4120 ft. Darby Pet. Co.'s McCoy 1, sw sw sw 24-23n-2w, rur.

OKFUSKEE COUNTY—Burke-Greis' Rhea 1, sw sw se 14-10n-9e, skid rig 20 ft. F. W. Merrick's Mackey 1, ne ne sw 29-11n-10e, dr 3140 ft.

OKLAHOMA COUNTY—Frank Buttram et al's Cole 1, nw nw nw 16-14n-1e, sdo 5870 ft. Ardie Oil Co.'s State 1, ne ne se 16-14n-4e, rig.

OSAGE COUNTY—Nat'l Ref. Co.'s Page 2, nw sw se 28-22n-9e, lcn.

PAWNEE COUNTY—J. F. McManman et al's School Land 1, nw nw ne 16-21n-5e, rur.

PAYNE COUNTY—H. S. Brim et al's McKenzie 1, cwl se ne ne 13-18n-3e, c&p. Stanolind & Amerada's Bennett 1, nw se ne 31-19n-4e, lcn.

PITTSBURGH COUNTY—Okla. Dist. Oil Co.'s Beeler 1, ne ne sw 7-7n-14e, sd.

PONTOTOC COUNTY—Norbla Oil Co.'s McBride 1, ne ne sw 10-2n-5e, lcn. Union Dev. Co.'s Abbott 1, sw nw ne 34-3n-6e, dr pipe stuck 2500 ft. Kerlyn Oil Co.'s Pratt 1, sw se ne 6-4n-4e, abnd 2355 ft. Boettcher O&G Co.'s Gann 1-A, se nw ne 25-4n-7e, fsg dr pipe 4347 ft.

POTTAWATOMIE COUNTY—Richborn Oil Co.'s Fidler 1, ne ne ne 9-5n-5e, rig temp abd. Hightower's Baker 1, se se nw 27-6n-3e, rig. Roy S. Nash et al's Miller 1, cn½ ne se 29-6n-3e, testing. Mid-Continent Pet. Corp.'s Ne-Thah-Pea-Se 1, se se ne 24-11n-4e, sd for connections.

PUSHMATAHA COUNTY—Halliburton et al's Gabwell 1, sw ne ne 20-2s-15e, dr 5050 ft.

SEMINOLE COUNTY—Stanolind, Amerada and Mid-Continent's Salina 1, se ne nw 4-5n-6e, pb 3272 ft; recementing. J. F. Root's Cone 1, nw ne sw 11-7n-5e, c&p. E. W. Jones et al's Belford 1, ne se ne 9-9n-8e, abnd 4596¼ ft. Phillips' Gilcrease 1, nw nw se 16-7n-12e, dr 2430 ft.

STEPHENS COUNTY — Coline Oil Co.'s Johnson 1, sw se ne 1-2n-8w, dr 9325 ft. Ed Parsons et al's Blake 1, csw nw 22-2n-8w, sd for pump bbl. Newsom's Pfile 1, sw sw sw 1-2s-7w, sd 115 ft. Jack Cohen's Pierce 1, ne ne nw 24-2s-6w, fsg 1355 ft. Carter et al's Harley Community 1, cne ne 24-2s-4w, flow 216 bbls oil, 1 hr 55 min, comp.

TILLMAN COUNTY—I.T.I.O. Co.'s Graham 1, se se ne 1-3s-19w, swb av. 523 bbls oil daily for 4 days, comp. Gulf's Prichard 1, se nw se 32-3s-16w, dr 3196 ft. Tom Walker's Bowman 1, sw sw nw 10-4s-17w, sd 200 ft. Caven et al's Southerland 1, sw sw nw 35-4s-16w, sd 44 ft.

WASHITA COUNTY—L. B. McWhirter et al's Fee 1, nw sw sw 34-8n-19w, sd 1810 ft. John Koberg's Harms 1, nw nw ne 6-10n-16w, dr by 4200 ft.

SOUTH TEXAS
LAREDO DISTRICT

DUVAL COUNTY—John H. Hougen, Trustee's W. H. Patton Trustee 1, sur 148, abnd 3005 ft. Magnolia's DCRC 1, GC&S sur 259, coring 3105 ft. Navarro Oil Co.'s Standard Trust Co. 1, C E P Irr & Mg sur, dr 1750 ft. Parr and Delaney Oil Co.'s F. Vaello Puig 12, San Andres grant, td 4801 ft, dr plugs, 7 in 4792 ft, drill stem test through perforation 4745-85 ft, ⅜ in top and bottom chokes, recovered 450 lbs. pressure, 60 ft oil and mud, cored shale at 4785-94 ft, cored oil 4794-4801 ft. Penn-Palangana Oil Co. et al's C. K. Gravis 1, in sec 254, junked 6165 ft. H. J. Porter's Sevier 1, sec 754, J. A. Cuellar gr, dr 4282 ft. Rudco Oil & Gas' K. L. Ellis 1, GC&SF sec 308, to spud. V. G. Schimmel's E. R. Hagist 3, BBB & C sec 4, dr 1829 ft. Slaughter & Hugle's Hunter Estate 1, J. Pointevent sur, set surface casing. Speed Oil Co.'s Gruy Estate 1, sec 389, coring 2675 ft. Standard of Texas' Gruy Estate 4, sec 154, dr 2329 ft. G. Stratton & Baltimore's Afflerbach 1, center of sur 342, abnd 1210 ft. E. Renshaw Thomas Estate's E. V. de Pena 1, J. A. Garcia sur 8, sd 3125 ft. Tsesmelis & Reese' Juan Canales 2, blk 75 of Juan Canales Ranch San Juan gr, sd 3935 ft.

JIM HOGG COUNTY—Henry M. Brown, Trustee's S. Gutierrez et al 1, sur 579, dr 2310 ft. French Oil Corp.'s Paula V. de Garza 5, sur 39, coring 1045 ft.

McMULLEN COUNTY—Adams & Lefevre's Margaret Selman 1, sec 58, A. Spaulding grant, coring 1350 ft. W. P. Howard's B. C. Claunch 9, M. Hely sur, rigging up. Rowan & Nichol's Douglas W. Rhodes 1, M. F. Lowe sur, dr 2321 ft.

STARR COUNTY — Barnett-Porter & Brown's Miguel Valdez, por 84, abnd 2006 ft. Calderoni-James-Follette's Francisco Rodriguez 1, por 80 J. of Camargo, dr 1710 ft. Dean Bros.' Miguel Valadez 1, sd 1873 ft. J. W. Edwards' Quirino Vela 1, El Tanque subd, por 84-85, dr 1539 ft. Gilcrease Oil Co.'s Kelsey-Bass 1, sec 11, por 75, J. of Camargo, sd 3257 ft. Henshaw Brothers and Davis' M. M. Garcia 1, por 89, dr 212 ft. McAlister-Espenlaub's Ben D. Wood 1, por 84, mim. K. E. Merren's Starr County Cattle Co. 1-A, Jefferies & Lambeth subd, td 5615 ft, swabbing, flowing via artificial lift, perforations 5417-27 ft, 7-in at 5353 ft, 5-in liner to 5417 ft. Sun Oil Co.'s F. S. Guerra 1, por 111, lcn. Tranwestern Oil Corp.'s T. B. Slick School 1, sur 266, fsh 5374 ft.

WEBB COUNTY—Adams & Lefevre's E. Garcia 1, sur 592, dr 1510 ft. J. B. Blanchard et al's Laurell Bros. 1, sur 1006, 1 mi south of Oilton, dr 54 ft. J. E. B. Boone's Pearl H. Masterson 1, CCSD&RGNG sur, dr 1581 ft. N.

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1207-11 TOWER PETROLEUM BLDG.—DALLAS

V. Duncan & Oklahoma Company of Texas' Ft. Worth National Bank, sur 466, dr 200 ft. J. W. Magee's E. Garcia 1, Henry James subd, abnd 2017 ft. E. J. Pearl et al's De la Garza Est. 2, sur 48, skid on. Randon Oil Co.'s Joe C. Palmer 1, sur 474, dr 820 ft.

ZAPATA COUNTY—Eugene Mays et al's Adela G. de Flores 1, Charco Redondo gr, dr 1632 ft.

CORPUS CHRISTI DISTRICT

ARANSAS COUNTY—Barnsdall's Kate Edwards 1-A, Wm. Lewis sur, td 9785 ft, drill stem test tested salt water and little gas, perforations 8017-23 ft, completed as a gasser, 7502 ft.

BROOKS COUNTY—Standard Oil Co. of Texas' Mestina 1, (lease 1), R. G. Salinas sur, td 3588 ft, made 115 bbls, 211 salt water in 24 hours at 3579 ft, preparing to dr deeper; Mestina 9 (lease 1), R. G. Salinas sur, rigging up; Mestina 2 (lease 2), R. G. Salinas sur, td 2400 ft, dr stem test 2392-2400 ft, in 1 hour recovered 180 ft oily mud and sand, first 15 minutes pressure was 33 pounds at top of drill stem, pressure fell to zero, then flowed dry gas and sand, shut in, cemented o¾ gas sand with 250 sacks, waiting on cement.

COLORADO COUNTY—Coyle-Concord Oil Co.'s South 2, I&GN sec 41, td 6036 ft, complete, 75 bbls 53.8 gravity oil, 3/32-in; 7-in 6029 ft, sand 6030-36 ft, pressure equalized at 2300 lbs, high gas, oil ratio.

HIDALGO COUNTY—Dee Davenport et al's Hidalgo District 6, sec 262 La Mestina grant, dr 4067 ft. Gulf States Oil Co.'s Delta Orchards 2, Delta Orchards sub, dr 2350 ft. Y. & B. Oil Co.'s Waite Brothers 1, sh 382, Los Ejidos gr, dr 3600 ft.

JACKSON COUNTY—Texas Co.'s C. E. Niebuhr 1, O. S. York sur, dr 6425 ft.

JIM WELLS COUNTY—Magnolia et al's A. A. Seelngson 7, Los Jaboncillos sur, td 6508 ft, washed down to drill collar, preparing to core.

KARNES COUNTY—Ivan W. Howard's F. P. (W) Moczygamba 1, in E. Seguin sur 5, dr 1009 ft.

LIVE OAK COUNTY—Mills Bennett Prod. Co.'s Watson & Shipp 2, P. Salinas sur, preparing to spud. Charles Hannah's C. H. Wedding 1, B. Haughy sur, sd 760 ft. Holland and Coquat's Matikin 1, A. Glavecke sur, woc 1512 ft. Unit Pet. Co.'s W. O. Nichols 1, Simon Ryan sur, abnd 1467 ft.

NUECES COUNTY—Camp Prod. Corp.'s Wardner 1-A, Paso Ancho Abajo and Paso Ancho Ariba surveys, td 1292 ft, cored sand with shale at 6273-81 ft, good sand 6281-92, drill stem test 6273-92 ft, 100 ft gasoline and mud, 375 lbs pressure ¼ and ⅜ inch chokes 5 minutes, coring. Seaboard's Luby 2, Palo Alto Grant, Canutillo Ditch Colony sur, td 5059 ft, complete, broken sand 5020-59 ft, 7-inch 5059 ft, perforation 5049½-53½ ft, 180 bbls oil in 12 hours, ⅛-in choke. United Prod. Corp's T. S. Schroeder 1, A. F. de la Fuentes sur, coring 6854 ft. Sam E. Wilson's J. F. Herold 1, Villareal sur, sec 6, abnd 7268 ft.

REFUGIO COUNTY—Hogan Oil Co.'s J. S. Kelly 1, James Power sur, mim.

SAN PATRICIO COUNTY — Argo Oil Corp.'s A. Soehnge 1, in P. J. & M. Delgado grant, preparing to spud. Danrey Oil Co.'s Jean Davis 1A, in Wm. Boyd sur, sd 7117 ft. F. P. Schwab's H. A. Smith 1, Juan Hart & Sons grant, dr 5105 ft. Waterbury Oil Corp.'s Jean Davis 1, G. W. Grover sur, dr 4510 ft.

VICTORIA COUNTY — Gulf's Mahon & Buehler 1, J. Poietevent sur 2, dr 3420 ft. Magnolia's Willie Beck 2, TNO sec 1, dr 4069 ft. Stanolind's Henderson & Pickering 1, E. Benavides sur, coring 4769 ft. Wallace & Sollars et al's Etta B. Terrell 1, J. M. Galban sur, spudded.

WILLACY COUNTY—Magnolia's F. Armendia 1, San Juan de Carricitos grant, 13⅜-in 2250 ft. Shell et al's Yturria Cattle Co. 2, sh 64, dr shale 5335 ft.

SAN ANTONIO DISTRICT

ATASCOSA COUNTY—Brown & Bell's G. C. Atkins 1, BS&F sec 3, dr 1050 ft.

BASTROP COUNTY—J. W. Bibb et al's O. B. Lentz 1, Freeman Wilkinson sur, sd 210 ft. H. & H. Drilling Co.'s Earl C. Erhard 1, Hill's Prairie Community, dr 410 ft. Hantho-Nelson's K. M. Litton 1, Addison Litton sur, sd, hole heaving, will shoot. Marts & Beavans' C. L. Lackey 1, Joshua Gray sur, set surface casing.

BEXAR COUNTY—Dewey et al's C. A. Weeber 1, Juan Montes sur, abnd 21 ft. E. C. Roberts' C. A. Weeber 1, Juan Montes sur, dr brown shale 1128 ft. J. O. Williams et al's A. W. Bitter 2, dr 150 ft.

CALDWELL COUNTY—B. C. Armstrong et al's Wilson Bell Est. 1, in Solomon Seal sur, td 2465 ft, preparnig to drill deeper into chalk. Brady Bros. & Pummel's A. B. Jackson 1, S. Morris sur, dr 650 ft. Chisholm and Associates' F. Lane 1, Byrd Lockhart sur 8, abnd 2190 ft. Ellmag Oil Corp.'s Willie Pope 1, J. D. Rains sur, to resume. Lanning & Coffield's W. R. Trammell 1, Guadalupe College sur, dr 2040 ft. Taylor Ref. Co.'s S. Punch 1, Guadalupe College sur, dr chalk 1835 ft. Mrs. M. R. Tinkle's S. M. Blackwell 1, R. Miller sur, abnd 2180 ft.

COMAL COUNTY—John R. Yates' Erhard Heidrick 2, A. M. Holbrook sur 423, dr 487 ft.

DIMMITT COUNTY—Paul Teas and Maryland Corp.'s S. E. McKnight 1, I&GN sur, cored sandy shale 1815-34 ft. Wilcox O&G Co.'s Light Ranch (Luminar) 2, sec 29, abnd 5915 ft; Light Ranch (Myssie) 3, sec 13, dr 4323 ft; Light Ranch (David) 4, lcn.

EDWARDS COUNTY—Dan Auld's L. H. Henderson Estate 1, HE&WT sur, dr shale 4565 ft. Amon G. Carter et al Frank J. Sweeten Ranch 1, GC&SF sur, dr 4805 ft.

FRIO COUNTY—Amerada's Mrs. D. D. Harrigan 1, Salvador Flores sur 306, td 6410 ft, shut in making little oil. H. A. Pagenkopf and L. C. Jamieson's Houston Estate 1, Juan Figuerroas sur, dr 40 ft.

GUADALUPE COUNTY—T. H. Coulter's August Engelke 1, Harriet Cottle sur, fsh 2012 ft. Diamond Half Oil Co.'s E. Bibbs et al 2, J. D. Robinson sur, td 2516 ft, pumped 400 bbls fluid, 10% sulphur water, 7-in 2510 ft. Kennedy & Crowley, Gus Jahns 1, Jose K. Davis sur, sd 2507 ft. W. W. Lincoln et al's J. H. Sherrill 1, F. C. Gabriel tr, dr 670 ft. Rheingold & Rueben's Johnston 1, I&GN sur, fsh 1800 ft. Wellington Oil Co.'s Chittim Ranch 1, I&GN sur, coring 3140 ft.

MEDINA COUNTY—R. S. Bolling's A. C. McMenemy 1, sec 33½, moving in. Frank A. Brown's J. Bilhartz 1, J. Campbell sur, abnd 1450 ft. Felfar Oil Co.'s Flora H. Briscoe 1, Aloys Schmidt sur 8, abnd at 2523 ft.

WILLIAMSON COUNTY—Thomas W. Davis, Jr.'s Fee 1, Thos. H. Boggus sur, dr 565 ft.

WILSON COUNTY — Diamond Half Oil Co.'s R. C. Donaho 1, J. Reynolds sur, rigging up. Pat Higgins' Mary Dickey 1, dr shale 1910 ft.

TEXAS GULF COAST

BRAZORIA COUNTY—Jack Frazier's Temple Lumber Co. 1, e of Bonney, H&TB Section 35, abn 7514 ft. Pure's Slade 1, Peach Point area, S. F. Austin Survey, Abstract 20, milling 8397 ft.

CHAMBERS COUNTY—Ingot & Merit Oil Co.'s Wright Land Co. 1, Cedar Bayou area, C. Smith sur, dr shale 5764 ft.

COLORADO COUNTY — Coyle Concord's South 2, Garwood area, I&GN No. 41, comp 75 bbls distillate 6034 ft.

FT. BEND COUNTY—Humble's Schulze 1, Needville area, R. Hodge sur, coring shale 4759 ft. Research Oil Co.'s Moore 1, ne of Orchard, S. Kennedy sur, dr shale 6680 ft. Windward Oil Co. & H. B. Ownby's Simms 1, e of Beasley, H&TC Section 1, woc 1287 ft.

GALVESTON COUNTY—Maco Stewart's Maco Stewart 1, Hitchcock area, J. Spillman sur, potential test, 219 bbls daily, 5156 ft.

HARDIN COUNTY — Coronado Oil Co.'s Ryan 1, Hathaway area, J. G. Bell sur, dr shale 3765 ft.

HARRIS COUNTY—Texas Gulf's Moore 1, Aldine area, W. C. R. R. sec 18, coring shale 6823 ft. Superior's Butler 1, Bammel area, J. Ehrhardt sur, comp as gas well at 6170 ft.

LIBERTY COUNTY—O. C. Carvey's Weaver 1, nw of Cleveland area, J. Devers sur, dr shale 5609 ft. Humble's Sabine Tram 2, Devers area, M. Whittington sur, coring shale 5887 ft.

MATAGORDA COUNTY — Continental's Hawkins 2, D. McCarthy sur, coring shale 8645 ft.

NEWTON COUNTY—Houston Oil Co.'s Peavy Moore Lbr. Co. 1, H&TC No. 42, setting 7-in csg 7069 ft.

WHARTON COUNTY — Buck & Holt's Rainer 1, Blue Basin area, F. C. McReynolds sur, dr and ru.

WYOMING

CARBON COUNTY—Ohio Oil Co.'s Wyoming Oil & Gas Co. 1, csw sw 29-27n-89w, ran 75 sacks cement to shut off bottom hole water & squeezed 300 sacks between 7 and 10 in casing strings.

HOT SPRINGS COUNTY—Oscar B. Grace's 4, n se nw 21-43n-92w, dr 378 ft.

NIOBRARA COUNTY—Lewis Gokel's 1, ne se nw 31-35n-62w, dr 1550 ft. W. A. Maupin et al's Berggren 1, nw 23-35n-63w, ru.

SWEETWATER COUNTY—Mountain Fuel Supply Co.'s W. L. Williams 1, ce ne 5-12n-95w, spd 650 ft and set 585 ft 12½-in surface casing.

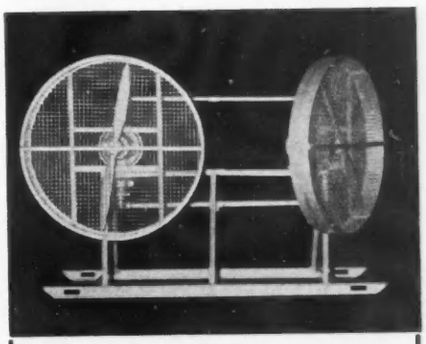
WESTON COUNTY—John Brorby's 1, sw se nw 26-48n-64w, dr 796 ft. Mush Creek Oil Co.'s Carmine 1, cse sw 31-44n-62w, spd.

UTAH

GRAND COUNTY—Cane Creek Oil Co.'s Government 1, nw sw 31-26n-21e, dr 360 ft.

THE FORT WORTH LABORATORIES

Analyses of oil field brines, cores, gas, oil, and minerals. Field gas testing. R. H. Fash, Vice-President; Long distance 138. 828¼ Monroe Street, Fort Worth, Texas



Adjustable . . .

TWIN BUG BLOWER

Sold Thru Supply Stores

The 8 ft. Adjustable Twin Bug Blower has the more efficient two blade 40-inch Airplane type propeller of cast aluminum alloy which is not affected by the weather. Being adjustable this blower will affect more derrick floor area than other types.

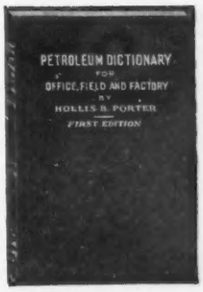
GARROTT BRASS & MACHINE CO.

1718 ENNIS ST. HOUSTON, TEXAS

PETROLEUM DICTIONARY

By HOLLIS P. PORTER

Member of American Society of Mechanical Engineers, American Petroleum Institute



This work grew out of a demand for some source of definition for the terms used by the petroleum industry. It contains over 3,000 definitions of words used constantly by all phases of the petroleum industry. It was published in 1936 and has found its way into engineering departments, legal departments and land departments of producing concerns, as well as to the desks of executives of the petroleum industry.

Manufacturers also find it valuable for reference. Advertising agencies find it a valuable addition to the library.

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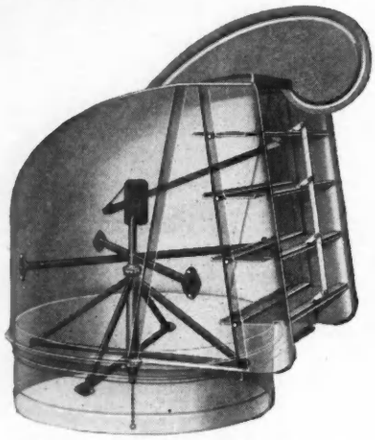
ROTARY ROOF VENTILATOR
The Swartwout Company



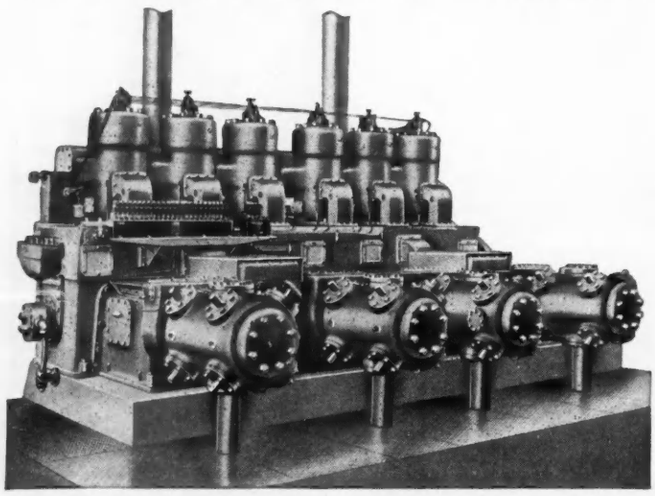
Swartwout Rotary Ventilator

Swartwout Company, 18625 Euclid Avenue, Cleveland, Ohio, announces a new rotary roof ventilator for industrial and commercial buildings. In basic principle it is the same as the original Swartwout rotary, but in detail construction offers many improved features of recent development. Foremost of these is the new stainless steel, fully enclosed, dust-tight, oil-less ball bearings on which the head turns with the wind. Interior construction is of streamlined steel tubing welded into a one-piece head frame of great strength and minimum friction resistance. The body is designed along modern lines resulting in a low pleasing appearance with a slightly increased area in the discharge opening. Greater capacity per size is secured in addition to extra strong and substantial construction.

The new rotary is made in sizes from 12- to 72-inch throat diameter and is especially adaptable to general industrial and commercial building ventilation as well as for removal of smoke, fumes, excessive heat, moisture, and similar substances.

COMPRESSOR
Clark Bros. Company

Clark Bros. Company, Olean, New York, has announced that it is now in production on the big 6-cylinder, 600 horsepower size of its "Super-2-Angle" Compressor introduced a little more than a year ago. This compressor is now offered in 2, 3, 4 and 6-cylinder sizes, ranging from 200 horsepower to 600 horsepower.



Clark Bros. Compressor

It is claimed that this compact right angle compressor, while occupying much less floor space per horsepower than horizontal types, includes all of the desirable features of the horizontal compressor. The Clark Super-2-Cycle fuel injection system used for many years on Clark horizontal compressors is a feature of the new angle machine, as well as the special Clark scavenging method which provides 25 percent excess air for the power cylinders.

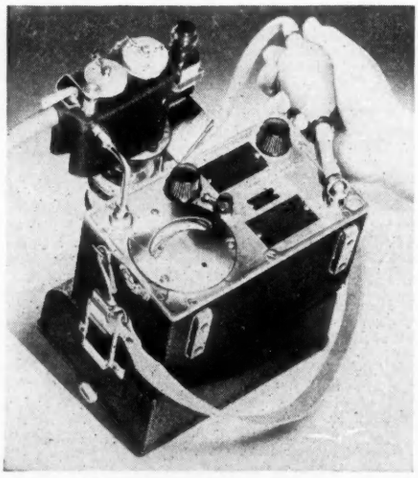
STREAMLINE PLUNGER PUMPS
Pacific Pump Works

Pacific Pumps Works, 5716 Bicket Street, Los Angeles, announce a new plunger pump of which George Bigelow, president and general manager of the company, says:

"We have felt for a long time that a great deal of unnecessary turbulence and fluid friction has been caused by the sharp interior corners found in the old style plunger pump. Our designers and engineers working with field men have now brought out a line of standard pump fittings in the convenient 2, 2½, 3, and 4-inch sizes that embody the entire streamlining, without in any way weakening or altering the fundamental design of the parts."

UCC GAS INDICATORS
Linde Air Products Company

The Linde Air Products Company, New York, N. Y., announces a new line of gas indicators, developed for quickly and easily detecting explosive or irrespirable gas-air mixtures, the UCC Gas Indicators. These instruments are designed to fulfill the requirements of locating underground leaks, establishing purge-end points, and determining hazardous conditions in manholes, oil tankers, oil storage tanks, holds of ships, sewers, conduits and tunnels.



The UCC All-Service Indicator Model B-1 affords a quick and accurate means for detecting explosive or irrespirable gas-air mixtures.

UCC Gas Indicators are available in three models. The UCC Combustible Gas Indicator Model 12-B is for the detection of combustible gases or vapors. A graduated meter scale indicates by direct reading whether combustible gases are present, and, if they are, whether concentrations are above, within, or below explosive limits. For increasing the utility of this instrument, a flame-type safety lamp attachment is available which makes it additionally possible to detect oxygen deficiencies.

The UCC All-Service Indicator Model B-1 combines three units in one. It shows the presence of combustible gases, indicates an oxygen deficiency, and, in addition, includes a toxic chamber for determining the presence of

carbon monoxide and hydrogen sulphide in dangerously toxic concentrations.

Both the Combustible Gas Indicator and the All-Service Gas Indicator are equipped with a patented and exclusive air dilution valve. By means of this valve, incoming samples can be diluted with any volume of air, thus making it possible to detect flammable conditions which might not otherwise be indicated due to a lack of oxygen. It also permits following a complete purging operation from start to purge-end point with the use of inert gas as a purging medium.

WATER COOLING UNIT

Driftmeter, Incorporated

Driftmeter, Incorporated, National Bank of Tulsa Building, Tulsa, announces a new water cooling unit for internal combustion engines and compressors, which, according to the manufacturer, incorporates several original features in cooling unit design. Outstanding among these features are: the fan and water pump are driven in the same shaft, thereby eliminating a separate belt drive from shaft to water pump; adjustable pitch fan blades for regulating air output at different altitudes; welded construction throughout.

The radiator core is an adaption of the tubular radiator principle. The tubes are flat, are of a heavy-gauge copper with lock-seamed joints.

An airtight pressure chamber built in such a manner as to work every part of radiator at nearly a constant rate.

The unit is available in different sizes with capacities for cooling engines ranging from 25 to 130 horsepower.

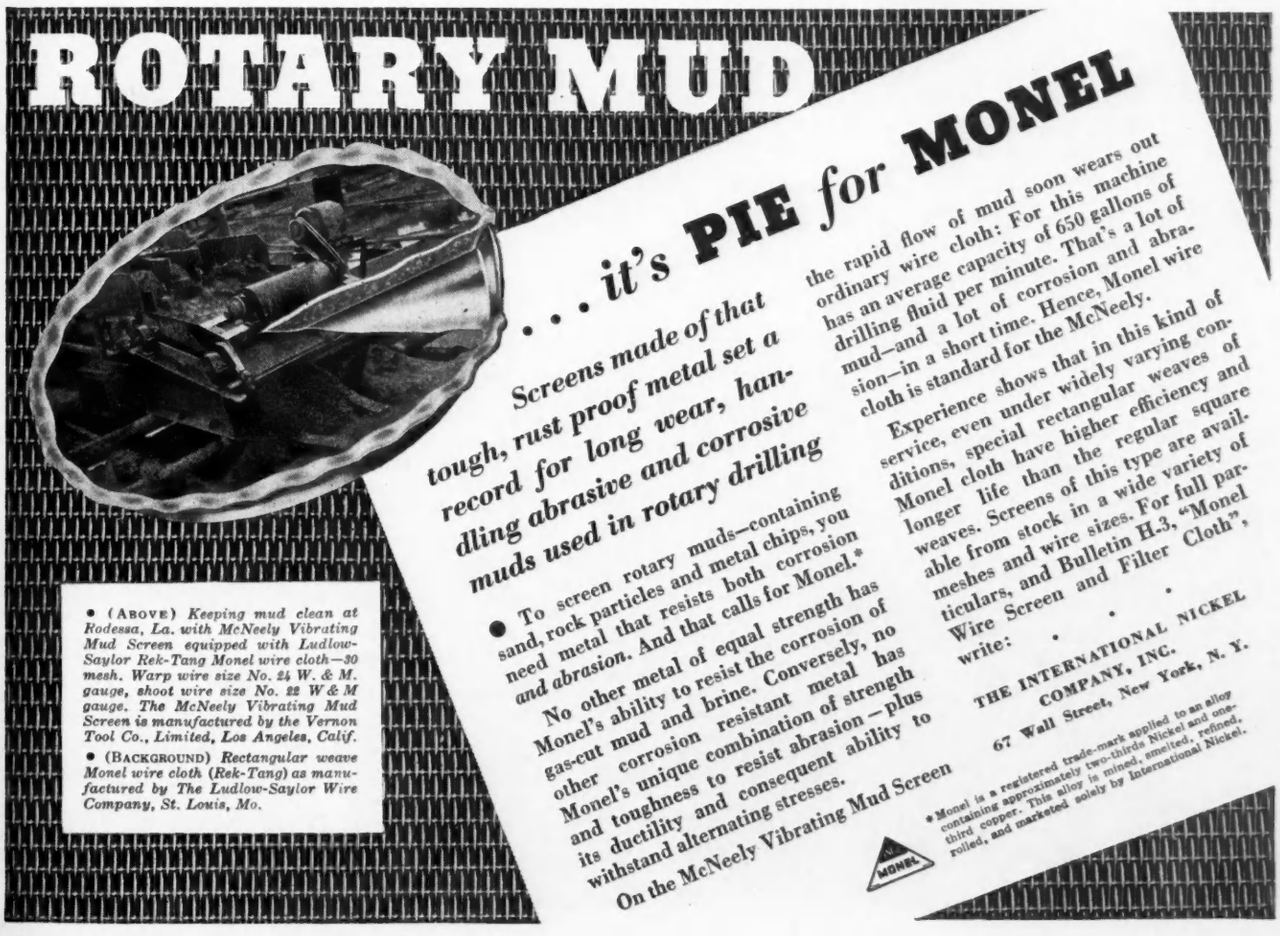
VARI-SPEED PULLEY

Columbia Vari-Speed Company

Columbia Vari-Speed Company, Wheaton, Illinois, has developed the JFS-Jr. Vari-Speed Control, a new and improved application of the variable pulley principle. The unit consists of two interlocking, variable pulleys mounted on a single shaft. To change the speed, the pulleys and shaft are pivoted laterally through a determined arc toward or away from the drive or driven pulleys by means of the control handle. As this change is made, the resulting belt tension in the one belt and the slack in the second automatically adjusts the pulley diameters to give a new ratio between the pulleys' running diameters. Each pulley is dependent upon the other so that they are perfectly adjusted in all positions. This mutual compensation relieves all belt strain.

Columbia Vari-Speed Pulley

Perfect belt alignment is maintained in all positions due to the special base mounting which automatically centers the variable pulleys with the drive and driven pulleys. Standard V belts are used. The JFS-Jr. is made in sizes from fractional to 7½ horsepower.


ROTARY MUD
. . . it's PIE for MONEL
Screens made of that tough, rust proof metal set a record for long wear, handling abrasive and corrosive muds used in rotary drilling
● To screen rotary muds—containing sand, rock particles and metal chips, you need metal that resists both corrosion and abrasion. And that calls for Monel.* No other metal of equal strength has Monel's ability to resist the corrosion of gas-cut mud and brine. Conversely, no other corrosion resistant metal has Monel's unique combination of strength and toughness to resist abrasion—plus its ductility and consequent ability to withstand alternating stresses. On the McNeely Vibrating Mud Screen the rapid flow of mud soon wears out ordinary wire cloth: For this machine has an average capacity of 650 gallons of drilling fluid per minute. That's a lot of mud—and a lot of corrosion and abrasion—in a short time. Hence, Monel wire cloth is standard for the McNeely.
Experience shows that in this kind of service, even under widely varying conditions, special rectangular weaves of Monel cloth have higher efficiency and longer life than the regular square weaves. Screens of this type are available from stock in a wide variety of meshes and wire sizes. For full particulars, and Bulletin H.3, "Monel Wire Screen and Filter Cloth", write:
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N. Y.
*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled, and marketed solely by International Nickel.
MONEL

● (ABOVE) *Keeping mud clean at Rodessa, La. with McNeely Vibrating Mud Screen equipped with Ludlow-Saylor Rek-Tang Monel wire cloth—30 mesh. Warp wire size No. 24 W. & M. gauge, shoot wire size No. 22 W & M gauge. The McNeely Vibrating Mud Screen is manufactured by the Vernon Tool Co., Limited, Los Angeles, Calif.*

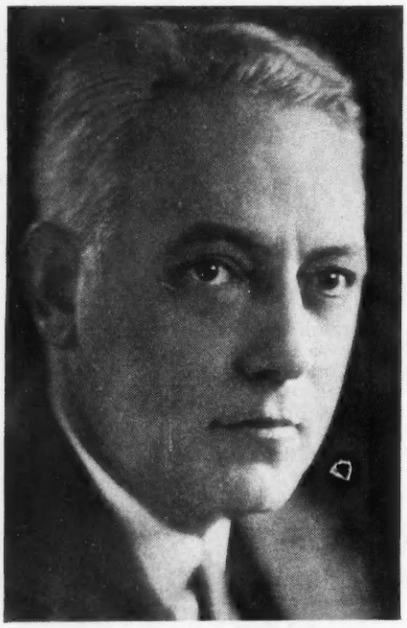
● (BACKGROUND) *Rectangular weave Monel wire cloth (Rek-Tang) as manufactured by The Ludlow-Saylor Wire Company, St. Louis, Mo.*

This Week with the Industry's EQUIPMENT SUPPLIERS

Ralph C. Harden Eastern Manager for Gustin-Bacon

Gustin - Bacon Manufacturing Company, Kansas City, Missouri, announces appointment of Ralph C. Harden as general manager of its eastern division, with headquarters in New York City.

Harden has had a well-balanced and successful sales and executive experience. For a number of years he was associated with Johns-Manville Sales Corporation as salesman, insulation and packing sales manager, division manager and regional vice president, with headquarters in Chicago. For the past three years he has served as general department sales manager with the United States Rubber Products, Incorporated, New York.



RALPH C. HARDEN
General Manager for Gustin-Bacon Manufacturing Company in the East.

Wilkes Campbell Sales Manager for Asbestos Manufacturing

Asbestos Manufacturing Company, Huntington, Indiana, announces the appointment of Wilkes Campbell as sales manager, oil field materials division. In his new capacity, he will direct the sale of AMCO products in the oil fields of Texas, Oklahoma and Louisiana.

Campbell has had many years of industrial experience, and for the past five years has been AMCO service manager. His knowledge of oil field problems will prove of great help to his clientele.

WILKES CAMPBELL
Sales manager for Asbestos Manufacturing Company

Sterling Packing Occupies New Building

Sterling Packing & Gasket Company, Houston, recently completed a new building at Nance and Hardy streets.

The company was organized in April, 1933, and serves Texas, Louisiana, Oklahoma, Arkansas, New Mexico, and Kansas.

Officers of this company are L. J. Langston, president, and J. E. Sandsberry, vice president.

New headquarters of Sterling Packing & Gasket Company at Houston.

National Tube Names Moser Dallas Sales Manager

National Tube Company, Pittsburgh, announces the appointment of William C. Moser, formerly in charge of the St. Louis office, as manager of sales of the Dallas sales office.

Moser succeeds F. O. Young, who has been appointed manager of sales of the St. Louis office.

McAlear Names Kelly Southwestern Sales Representative

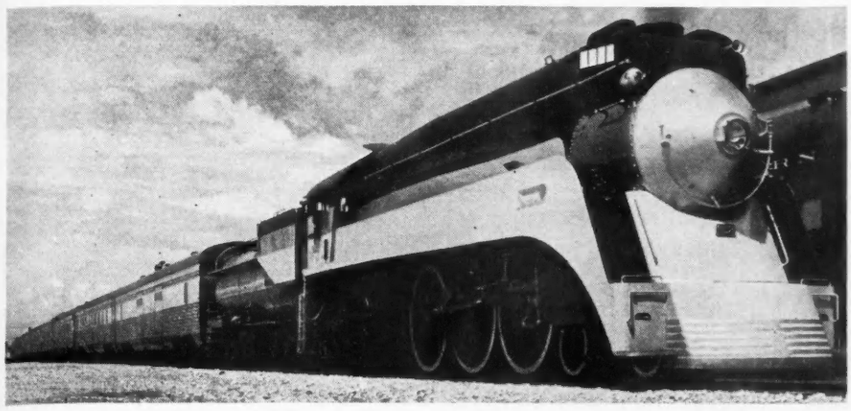
McAlear Manufacturing Company, Chicago, Illinois, announces the appointment of D. B. Kelly as southwestern district sales representative with headquarters at 1206 Willard Street, Houston, Texas.

D. B. KELLY
Representing McAlear Manufacturing Company in the Southwest.

Kelly has been handling sales for this concern in the Chicago and New York territories during the past several years. In his new connection he will travel in Texas, Louisiana, and Arkansas with the McAlear line of pump governors, traps and strainers, backpressure and reducing valves, liquid level controllers for gas separators, regulators and other specialties for use in gas lift, gas booster and oil pipe line stations and repressuring plants.

Southern Pacific Fast Train Serves Oil Country

The Sunbeam, a new streamlined, air-conditioned train, which has just been placed in service between Houston and Dallas by the Southern Pacific Railroad, is of particular interest to oil men in that its northern and western connections permit oil and equipment men to leave Houston at 4 o'clock in the afternoon and arrive in Dallas at 8:45 that night, in sufficient time to make



Southern Pacific has arranged a fast schedule for this train between Houston and Dallas that is convenient for travelers between Mid-Continent and Gulf Coast oil centers.

necessary connections north into Oklahoma and west into western and northern Texas.

The schedule from Dallas calls for the Sunbeam to leave at 4:15 o'clock and arrive in Houston at 9:00, in sufficient time to make connections south and east.

The Sunbeam differs from a number of the streamlined trains recently placed in service in that it is an all-steam train. The streamlined engine burns fuel oil.

The train has passenger accommodations for 320 persons and includes a number of de luxe chair cars, parlor car, and combination lounge and cafe car. It is air-conditioned throughout and has a number of innovations in railroad passenger service.

Worthington Names Neill Sales Manager

Worthington Pump & Machinery Corporation, Harrison, New Jersey, announces the appointment of W. A. Neill as manager of engineering and sales activities at its recently reopened plant at Holyoke, Massachusetts. Neill was formerly manager of the corporation's air tool and portable compressor division at Harrison. He has been associated with Worthington since 1934, in charge of sales to mining and construction fields.

Stillwagon Makes Business Trip

C. K. Stillwagon, president of Well Equipment Company, Houston, is on a two-weeks business trip in California. On his return he will stop in Kermit, Texas, to meet O. W. Sanders, the company's representative for West Texas.

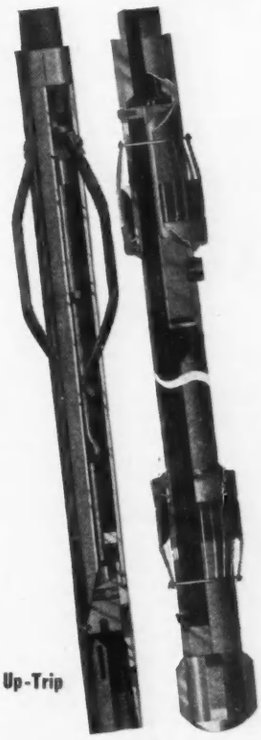
Stubbe Returns From South American Tour

G. Stubbe, vice president of American Askania Corporation, Houston, Texas, returned recently from a South American business trip, which took him to Venezuela, Peru, Colombia, Equador, Bolivia and Chile. He also spent a week in Mexico City on his return trip.

SUCCESSFUL FISHING TRIP

The above picture shows Arthur Penick, president of Oil Center Tool Company, Houston, Texas (right) and Roy Tribby, superintendent of Magnolia Petroleum Company, Sinton, Texas, after having caught 239 red snappers on a recent excursion in the Gulf of Mexico.

The CAVINS PERFORATION WASHER



The Cavins perforation Washer is a combination of the Up-Trip and Pack-Off Shoe, (shown here), with The Cavins Automatic Hydraulic Suction Bailer.

A Valuable Aid In ELIMINATING SAND BRIDGES

The source of a sand bridge can be eliminated by thoroughly washing the perforations at the point where loose sand runs into the well, with The Cavins Perforation Washer. If you are troubled with sand bridges, an occasional treatment of this kind will enable your well to stay on production for a much longer period of time. The Cavins is indispensable for this purpose.

Send for Catalog and Performance Data.

THE CAVINS COMPANY

2853-73 Cherry Ave., Long Beach, Cal.

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TEXAS: Houston, Kilgore, Odessa, Big Spring, Monahans, Pampa.
OKLAHOMA: Oklahoma City, Perry.
NEW MEXICO: Lovington. TRINIDAD, B. W. I.

Why drill and take a chance of

WHEN YOU CAN *increase present production* WITH A MILLER

It's expensive business drilling wells, why not first get your maximum production from your present wells. Clean out the sand and sediment that is holding back the oil. The MILLER Sand Pump will do it quickly and at small cost.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type, ¼-inch wall tubes HEAVY Type Sand Pumps.

INTERCHANGEABLE BOTTOMS
To Meet Every Condition

- **BAILER BOTTOM**
  With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.
- **SAND BOTTOM**
  Used when tools are run and when well is shot to quickly remove loose material.
- **STAR BOTTOM**
  Used for cutting the sand loose.
- **CHISEL BOTTOM**
  (In Pump)
  With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Page 1186 COMPOSITE CATALOG

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SAPULPA, OKLA. and KILGORE, TEX.

FOR SALE BY SUPPLY STORES EVERYWHERE

Squeaks from the Bull Wheel

Week's Best Definition

Sugar Daddy: One form of crystalized sap.

Bitter With Sweet

"How are you getting on keeping bees?"

"Very well. We have not had much honey, but the bees have stung my mother-in-law several times."

Knows All the Answers

"These rock formations," explained the guide, "were piled up here by the glaciers."

"But where are the glaciers?" asked a curious old lady.

"They have gone back, Madam, to get more rocks," said the guide.

The Reason Why

Manager: "What! You want another week off? You've just returned from your vacation."

Clerk: "But I want to get married, sir."

Manager: "Couldn't you get married during your vacation?"

Clerk: "I didn't want to spoil my vacation, sir."

Out of Date Soon

"Why do you have BF7652 tattooed on your back?"

"That's not tattooed, doctor. That's where my wife ran into me with the car when I was opening the gates."

Great Responsibility

"Who commands in your house?"

"We share the management. My wife bosses the servants and the children. I attend to the goldfish."

A "Line"

"Pa, what does it mean here by 'diplomatic phraseology'?"

"My son, if you tell a girl that time stands still while you gaze into her eyes, that's diplomacy. But, if you tell her that her face would stop a clock, you're in for it."

Stingy

"I wish I had a million dollars—I'd go to picture shows every day."

"You'd take me with you, wouldn't you, Willie?"

"Naw! If you're too lazy to wish for yourself you can stay home.

Strict

"Are they very strict at your college?"

"Are they! Say, when a man dies in a lecture, they prop him up until the end of the hour."

May Be Right

"Your hat is on the wrong way, dear."

"How do you know which way I'm going?"

She Knew Her Man

"But, my dear madam, it's no use consulting me about your husband. I'm a horse doctor."

"That's why I came to you. He's a chronic kicker."

A Wise Answer

"Where is Jimmy this afternoon?"

"If he knows as much about canoes as he thinks he does, he is out canoeing, but if he doesn't know any more about it than I think he does, he's swimming."

Oh, My!

The chap had just been operated on in a hospital. When he opened his eyes the first thing he noticed was that the window shades in his room were down.

He summoned the doctor and asked why the blinds were that way.

"There's a fire across the street," replied the medico. "So I pulled the shades down because when you awakened I didn't want you to think the operation had been a failure.

High Cost of Loving

I'm going to sell kisses at the Charity Bazaar tonight. Do you think a dollar apiece is too much to charge for them?

No, I think not. People expect to get cheated at these charity affairs.

Another Golf Yarn

The two beginners were playing golf. The next green was 300 yards away over numerous hazards.

One shut his eyes and took a lusty swing. By a freak of chance he connected with the ball and sent it sailing for the green. It bounded directly into the cup for a hole in one.

"You've made a hole in one," exclaimed the other in an awed voice.

"I'll wager two-to-one I could do it again," bragged the first.

"Okay," grunted his friend, "It's a wager—but on one condition."

"Sure," agreed the confident one. "What's the condition?"

"This time," said the other, "you've got to make the shot with your eyes open!"

The Family Tree

"Been long in the service of the family, Jenkins?"

"Indeed, sir, I am now serving the third degeneration."

Restored

And did you restore the banknote you found?

Yes, sir.

To its owner?

No, to circulation.

One Is Enough

"I tell you it keeps me hustling to support two wives.

"You don't mean to hint that you've turned bigamist?"

"Oh, no. My boy William got married a couple of weeks ago."